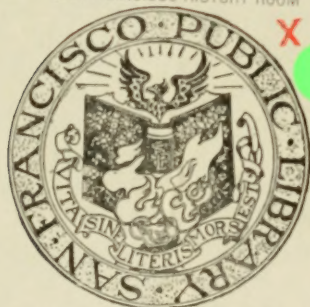


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Major Trends in Foreign Trade

MAIN currents in foreign trade are disclosed in a comparison of the results of the first nine months of the current year with the average for the same period during the five years, 1923 to 1927, made by the Foreign Commerce Department of the Chamber of Commerce of the United States in Our World Trade.

Some of the results disclosed by this comparison are:

"1. Nine-month exports by value this year are 8 per cent over the above-mentioned average, but imports are only 1.5 per cent above.

"2. Exports of finished manufactures by value gained 25 per cent over the average. Crude foodstuffs exports fell 23 per cent.

"3. Canada, our best market, taking 19 per cent of our exports, gained 29 per cent over the average.

"4. Automotive exports by value are 77 per cent over the average; industrial machinery 72 per cent; agricultural machinery 54 per cent.

"5. Raw silk imports by quantity are 29 per cent over the average; wheat 58 per cent; rubber 12 per cent. Sugar is 11

per cent below the average.

"With attention now directed toward South America it is important to note that sales to and purchases

Union Oil in the Antipodes

THE M. V. Brunswick, reputed to be the largest tanker in the world equipped with a diesel-electric system of propulsion, loaded a cargo for New Zealand and Australia at the Union Oil Company's dock, foot of Pier "A" Street, Wilmington, December 16.

The big tanker is electrically controlled and can be run from the bridge by one man by simply manipulating a single control lever. By this means he can start, stop, or reverse the electric propelling motors at will. Four full diesel engines of 750 horsepower each, driving 600 kilowatt generators, provide the electric power to propel the ship. Her cruising speed is 11 knots.

The Brunswick is owned by the Atlantic Refining Company and is being put into service between Los Angeles and the Antipodes by the Atlantic Union Oil Company, Ltd., jointly controlled by the Atlantic Refining Company of Philadelphia and the Union Oil Company of California. The New Zealand and Aus-

tralian market was opened up to California petroleum products last April and since that time tidewater stations have been established at Auckland, Wellington in New Zealand, and Melbourne and Sydney, Australia. Three additional stations are expected to be opened at Christchurch, New Zealand, and at Brisbane and Adelaide, Australia.

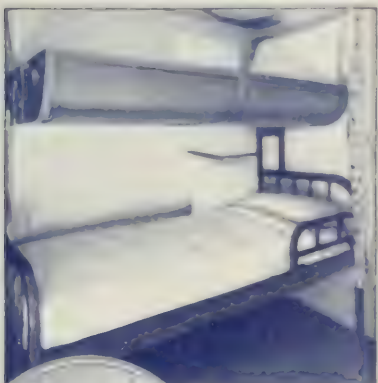
The Brunswick has a capacity of 120,000 barrels plus 6000 barrels of diesel bunkers. She is also equipped to handle package goods, case gasoline, kerosene and lubricants.

The C. & G. Cooper Company of Mt. Vernon, Ohio, has issued a booklet containing the history of the development of its engine building business entitled "95 Years of Engine Building." This is a very interesting series of accounts of the development of a responsible manufacturing concern in relation to its product, its customers, and its employees.

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January, 1928

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Official Organ
Shipowners' Association
of the Pacific

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American Shipping and Shipbuilding

THE United States is facing a crisis in the Shipbuilding Industry. We are number seven on the list as to tonnage building, those ahead of us being, in the order named, Great Britain, Germany, Italy, Holland, France, and Denmark. Of the new tonnage being built in the shipyards of the world on October 1, only three per cent was building in American yards. Several of our oldest and most experienced shipyards have closed their gates and abandoned the industry.

Notwithstanding the mandate of Congress in 1920 that 51 per cent was the least proportion of our foreign freights to be carried in American bottoms, that proportion has now dropped to 31 per cent and is still dropping.

Rear Admiral David W. Taylor, president of the Society of Naval Architects and Marine Engineers, in considering the problem, says:—

"One great reason why matters have reached their present pass is that there are so many methods of remedying them—all perfectly sound as a remedy.

Considering three broad divisions only—each having in it any number of possible variations—it is obviously possible, mechanically, under suitable financial arrangements that this country could have a merchant marine doing 51 per cent of its carrying trade under government ownership and operation, under government ownership and private operation, or under private ownership and operation.

The trouble is that hardly any two of the very large number of doctors that have been and will be consulted agree fully as to the relative cost and desirability of the many possible prescriptions that will cure the patient who for lack of some prescription grows steadily worse.

However, the nation-wide investigations completed by the Shipping Board last winter made it quite plain that a vast majority of our citizens wish a merchant marine under the United States flag. They wish the patient to be cured.

Let us hope that the doctors during the coming session of Congress—a very critical one for the merchant marine—may produce a prescription that will at least start the patient on the road to health."

These remarks are taken from the Admiral's speech opening the Annual Meeting of the Naval Architects, and he proceeds from this point to touch unerringly on the American Shipbuilding Problem.

"Let me remind you at this point," said the Admiral, "that of the complication of diseases with which the patient is afflicted the one which interests us most, pro-

fessionally, is the excess cost of building ships in this country as compared with foreign costs. This is, of course, due mainly to the fact that wages enter so largely into the cost of shipbuilding and our wage scales are above those of other shipbuilding nations. Here again the doctors differ as to the amount of the excess cost. The exact amount, however, is not the thing of importance. With capital charges—interest, depreciation, insurance, etc.—25 to 30 per cent of the cost of operation of a permanent merchant marine, we are under a crushing handicap whether our first costs are 40, 50, or 60 per cent above the foreigner. I earnestly trust that when the merchant marine prescription is compounded it will take care of this question of excess first cost, directly and definitely.

With any roundabout scheme there will be less pressure upon the profession to reduce first cost, and only by constant pressure in this direction and constant practice in building can we expect our excess cost to be lowered, even if not wiped out.

Of course there are doctors who would give up our shipyards and have a foreign-built merchant marine under the United States flag. They would not kill the patient, but only cut off a leg and an arm."

With our floating equipment outclassed by that of our competitors and with the handicaps of excessive cost of capitalization and operation indicated above, there certainly is need of a very strong prescription from this Congress if the merchant marine is to be maintained on any adequate scale. Congress is willing to provide funds for such a prescription if it can be shown that the prescription is acceptable to the various interests involved.

It is therefore up to those interests to get together and iron out their differences, if possible, so that they may come unitedly to Congress with a concrete workable proposition. This proposition will very evidently have to meet several dilemmas.

First, it must give greater profits to the American shipbuilder, while reducing the cost of the American ship to the American shipowner.

Second, it must provide greater net revenue for the American shipowner, while reducing overseas transportation costs for the products of American farms.

Third, it must maintain American standards of wage and living conditions, while reducing American ship operating costs.

All suggestions for the ironing out of differences over these dilemmas are complicated by the ever-present incubus of the Shipping Board fleet of idle, obsolete tonnage.

There is no response from the Field Office and Authority over Planning and Consulting which suggest that the other buildings share the same situation.

We are surely in need of some quantitative study of the extent to which the self-regulatory system in the US, together with the various attempts at self-regulation among APEC nations, is competitive enough. Surely,

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Figure 1 of this review can provide an overview which will illustrate the approximation of both national definitions and commercial entities.

It is a tragedy that most of the 100,000 women who are out of work and unemployed because of the recession be a better field to apply the lessons we learned from our participation in the Great Work.

Armies and air forces can be expanded with reasonable rapidity around the nuclei of regular establishments. The ships which are necessary for the sea arm of the navy are more numerous and more expensive to build than the land arm, and the latter is more easily expanded.

The superconducting transport will be supported by several other manifestations of quantum effects, and in particular, will lead to the superconductivity of the first quantum liquid according to Pauli theory, and to the formation of a Fermi sea, the precursor to the superfluid properties of superconducting He-4 liquids, which, according to theory, is now expected to be additional evidence for the existence of proton pairing in the superconducting materials.

of making one dollar do the work of two in our nat-

Crossing the Atlantic in Four Days

ON October 18, 1957, panel tests were conducted in the Naval Academy at Washington, D.C., which demonstrated the possibility of bordering "frontal" teeth posteriorly and, and exposed some inner structure while between American and European teeth.

These new designs were created by the efforts of several years of research, analysis, and design by some of the best naval architects and marine engineers and their civilian experts in the United States.

Of these projected ships, the report states further that:

"In their design and construction they will utilize engineering improvements, fuel economy, intensive use of equipment, and other factors of efficiency already achieved by American railroad and power industries but not yet applied to ocean transportation. They contemplate too the use of airplanes as a means of reducing mail and passenger travel to even less than four days' sailing time."

The service is protected by a group of American business men headed by Laurence R. Wilder, former president of the American Brown-Boveri Electric Corporation and now chairman of the Advisory Committee of the company's shipbuilding division.

Groups of experts from the Navy, the business world and the shipping fraternity are busily engaged in ironing out the wrinkles in the project and its structural and financial set-up; so that when presented to the government for approval and aid, its way may be smooth. It is the aim of the promoters that this service begin operating in 1930.

Foreign and Domestic Trade Outlook

By Julius Klenz

Director, United States Bureau of Foreign and
Domestic Commerce

[illegible]

will reach the record volume of \$1,600,000,000, and doubtless has had a considerable effect in increasing the volume of our export trade. There was also a large increase in our tourist expenditures abroad, which were substantially in excess of the \$761,000,000 figure for 1926.

Although domestic business was somewhat adversely affected by a sag in industrial prices, the trend since mid-year has been upward and figures in general for December have been nearly up to the average for the year 1926. Then, too, there have been a number of other reassuring developments in the domestic situation such as the improved conditions in the livestock, leather, and shoe industries which had not previously shared in the general prosperity. Accumulated stocks in most lines of goods continue to be reasonably low, and there is ample money available at moderate rates which, fortunately, has not thus far stimulated any undue credit inflation. Agricultural production and prices have shown marked improvement and consumption has continued to expand, benefiting both producers and distributors. Building activities during the closing weeks of the year have been fully up to the 1926 record, making the total for the year to December 1st only a fraction of one per cent below last year, and according to competent observers there are indications that 1927 may be even better.

Imports from every continent of the world have decreased in value during 1927. The most pronounced declines have been in our imports from Oceania and South America. Purchases from Europe, on the other hand, have been only slightly smaller in value than in 1926, and actually larger in physical volume.

In summarizing our foreign trade for 1927, we may say that it has continued to show remarkable growth in spite of a general lowering in world price levels and a moderate reduction in the activity of domestic business as compared with 1926 record figures. Our exports have shown a substantial growth, indicating a further strengthening of our position in world markets, while the maintenance of our imports at about the same high level as in 1926 indicates the general prosperity.

No. 24 Old Slip

WHEN on March 1, 1916, Stevenson Taylor assumed charge of the then almost moribund American Bureau of Shipping, he threw himself into the task before him with "his entire heart," bringing to the work many years of experience in ship construction and a very wide acquaintance with the leaders in the shipbuilding and shipping industries. The Bureau was in debt, its current funds were at a very low ebb, and frequently the personal credit of the managers had to be used to borrow funds to meet the payroll.

Through the hectic shipbuilding days of the great war and its aftermath, Stevenson Taylor guided wisely. With his clear vision and splendid organizing ability, he looked forward to the fulfillment of four great aims for the Bureau. As stated by President Charles McAllister:

"The first of these was a sufficient endowment to insure its stability, regardless of the periodical vicissitudes of shipping.



Bronze plaque on No. 24 Old Slip.

"The second was the organization of a high class technical and clerical system to meet the exacting requirements of a real classification society.

"The third was the establishment of an insurance and pension system for the benefit of the faithful employees of the Bureau.

"The fourth and last on the list was the securing of a suitable home for the Bureau, where its activities could be carried on in a building of its own."

When Stevenson Taylor died in 1926 these aims had one by one all been accomplished with the exception of the fourth and last. The board of managers and the officials of the Bureau determined that a home should be bought that would fulfill this one remaining ambition of their departed chief, and soon found a suitable building at No. 24 Old Slip.

This building was purchased and put in order, and on October 19, 1927 was dedicated as the home of the Bureau as a

memorial to Stevenson Taylor.

No. 24 Old Slip, as the name would imply, is close to the center of the shipping district of lower Manhattan. It is a fine type of heavy brick construction, with good arrangement of interior space for large, well ventilated, well lighted offices. It is equipped with a fire-proof and water-proof vault of ample capacity to store the records of the Bureau. This building will meet all the requirements of the American Bureau for many years to come, and is a very suitable memorial to the crowning achievement of the life of Stevenson Taylor.

America's Biggest Customer

WHATEVER difference of opinion might exist regarding the economic rehabilitation of Europe, that continent continues to be the foremost American customer. The Department of Foreign Commerce of the Chamber of Commerce of the United States, in its analysis, *Our World Trade*, reviewing the record of the first six months of 1927, says:

"Not only was the total value of outward shipments for that period the greatest first-half total since 1921, but that record was accomplished in spite of the fact that the average unit prices of seventeen out of twenty leading export commodities were lower than a year ago.

Europe continued the substantial buyer of our exports, all but three countries—France, Italy and the Irish Free State—buying more freely of American products."



New home of the American Bureau of Shipping, the Stevenson Taylor memorial building at No. 24 Old Slip, New York.

rational opinion that most of the new ships would be larger than the contract minimum. In fact the Lloyd Triestino company in 1926 built for its Asiatic contract two 13¹/₂ knot steamers each of 9,800 gross tons.

Government Cooperation in Shipbuilding

All ships for the Italian subsidized lines must be built in Italian shipyards except with the permission of the Minister of Communications, when he finds such yards impose onerous conditions. The Minister must also approve all plans for new ships. The obligation to build new steamers contemplated, in the first place, the improvement of Italian transportation facilities by sea and, in the second place, the employment of Italian shipyards. The many requirements of the subsidy contracts were such that the Government felt obligated to cooperate with the shipowners in attaining an end by which Italian shipbuilding would also be benefitted. Accordingly, it adopted the policy of granting the contracting shipowners the privilege of pledging in advance the subsidies they were yet to earn.

The analogous policy of loans was not wholly new. The Swedish Government in 1903 began to loan government funds to shipowners on condition that they build ships in Swedish yards. Between 1914 and 1920 these loans amounted to about \$1,000,000 a year. Following this example, Congress in Section 11 of the Merchant Marine Act, 1920, authorized the United States Shipping Board to set apart for five years from its revenues a construction loan fund, not exceeding \$25,000,000 in all to be loaned to private citizens to aid them in building ships in the United States, the loan in no case to exceed two-thirds of the cost of the vessel and to be suitably secured. By the Act of March, 1927, the five year limit was removed and the construction loan fund may amount to \$125,000,000 though at present it is approximately \$80,000,000. Under the British Trade Facilities Act of 1921, the British Government had guaranteed up to April 19, 1927, loans of from one to twenty years negotiated by shipping companies at about 5½ per cent interest to the amount of £20,791,000 for the construction of merchant ships in British yards of which some were for foreign owners.

Under the Italian construction system the pledge of subsidies to be earned, guaranteed by the government, as security for building costs, is confined to companies with which the government already has contracts. To the payments the government's faith is in fact pledged from sums due from the government on the performances of services in which there is a direct national interest. The subsidy contract in a word may be offered as security for the ultimate payment of the cost of building the ship.

During the first five years of the indispensable contracts, these sums, so secured cannot exceed four times the paid up capital stock, nor three-fourths of the value of the ship, nor 40 per cent of the subsidy remaining due when the loan is made. After the first five years the sums secured cannot exceed three times the paid up capital nor the other limits fixed for the first five years. The government requires a guaranty bond of title, clear of other incumbrances, that the ship under construction be insured by the company for its full value from time to time, and the usual provisions for the security of the loan.

Similar provisions are made for security for payment on ships building for the useful lines, but for such lines the sums so secured for the entire contract period (10 years) cannot exceed double the paid up capital stock, or two-thirds of the value of the ship, or

40 per cent of the subsidy still due at the time of the loan.

Contract Requirements for National Defense

Whenever a nation grants subsidies, it is general to include in the contract certain reciprocal obligations of the shipowner to his government; the Mussolini system is no different from others in this respect and the subsidy contracts include many obligations on the part of the shipowner which can be considered of great national benefit. These principal items in the Italian subsidy contracts are as follows:

Contract steamers on all useful routes and on those indispensable routes where a foreign port is served are each required to carry an extra certificated captain and an extra certificated engineer as relief officers. They are to be paid by the government monthly from 100 to 150 lire and to enjoy the privileges of their rank. Each is bound to serve one year on a ship and the company is required to provide a similar substitute in case the designated officer fails to report.

The subsidized steamers to Italian colonial ports and to foreign ports alike are required, whenever Italy mobilizes its armed forces, to give preference at embarkation to Italians called to the colors and such Italians are entitled to transportation at a reduction of 30 per cent of the regular fare. This reduced fare is also allowed to Italians en route to perform their periodical military duties or returning to their homes after such services have been rendered. The 30 per cent reduction in fares to and from colonial and foreign ports on subsidized lines is also allowed to all invalid and mutilated men of the armed services and to officials and sub-officials of those services, as well as to diplomatic and consular officials with their families en route to colonial duties. All groups are entitled to the reduced fares.

Reduced fares are also extended on voyages from Italian ports to all government employees and their families, to delegates to congresses, expositions, and fairs, to groups of working men, farmers and their families, if the groups exceed 20 persons, and to members of scientific expeditions when destined to foreign countries.

A reduction of 50 per cent. in fares is allowed to all invalids of the war returning to Rome for patriotic anniversaries; and a reduction of 75 per cent to citizens returning to take part in elections, and for one round voyage a year between the colonies or foreign ports and Italy to Italian or foreign youths who are students in the Royal University or Royal schools of higher instruction in the fine arts.

Free passage (food and drink are not covered by any of the reduced fares) are allowed for three voyages a year to all members of the Italian parliament with their families, going to or from its sessions, and on all voyages to all functionaries of the Merchant Marine, postal and telegraph inspection services while in the line of their duty. On all lines, free passage is also granted on any voyage to the colonies or foreign ports to two missionaries, either men or women. The contracts, of course, also contain the usual provisions of maritime nations for the repatriation of their shipwrecked seamen and citizens in distress abroad.

Freight Rates

Rates of fare for passengers and freights for cargo are fixed by the Minister of Communications on all voyages from Italian ports in either direction and between foreign ports of the Adriatic, of Tunis and Malta in trade with the Italian colonies and to foreign ports on the Red Sea from Aden and Suez in trade with

To Sell or Not to Sell?

President Coolidge on the Affirmative; Senator Jones and the Senate Commerce Committee on the Negative

By Clergue C. Schilling

PILOTS of the House and Senate are only a few weeks out on a long cruise, which it is expected for the most part will be over a stormy legislative sea. Before the sails are pulled and the "ship" docks at the port of adjournment early next summer much is hoped for in the way of marine activity.

Those interested in marine legislation this session are more hopeful than they were when the Sixty-ninth Congress came in two years ago. Due to the pressure of other legislation little attention was paid by the last Congress to measures relating to shipping. Although a large number of bills on this subject were introduced in both the Senate and House at Washington, the majority of them received no action whatever and died in the committees at the close of the Congress. Sixty-two marine bills were introduced last session, thirty-eight in the Senate and twenty-four in the House, and of that number only four were enacted into laws. Those which were passed were comparatively unimportant in view of the character of the proposed legislation which died with the Congress.

A new man steps in to guide marine legislation on the floor of the House, while over in the Senate the same "pilot" will be at the wheel. Representative Wallace H. White, Jr., of Lewiston, Maine, became chairman of the Merchant Marine Committee of the House by virtue of the retirement of Frank D. Scott of Michigan. Senator Wesley L. Jones retains his post as chairman of the Commerce Committee, the corresponding marine committee in the Senate.

Though Representative White's activity on the Merchant Marine Committee has been largely in connection with radio legislation, he is qualified as a marine expert, having served on the committee since he came to Congress fourteen years ago. Had White chosen to remain on the Rules committee and declined the chairmanship of Merchant Marine, the place would undoubtedly have gone to a Pacific coast member, Representative Arthur Free of California. It is interesting to note that even before he came to Congress White was identified with marine legislation for he was clerk to the Committee on Commerce in the Senate when a young man studying law in Washington.

Senator Jones is beginning his nineteenth year in the Senate and during most of that time he has been connected with marine legislation.

Administration Views

President Coolidge made it clear in his message to Congress that he desires to stop government ship operation and turn the ships the government now has over to private capital as a second line of naval defense.

Senator Jones does not agree with the President on this score and comes forth with the announcement that he will press his bill during the present Congress. Jones is quoted as saying, "We have reached a critical stage. Unless we do something this session that will bring about a program of replacements I think our merchant marine will be about gone before anything can be done."

The Jones bill, which was introduced soon after the Senate was organized, is virtually identical to the one which he succeeded in having reported out of the Com-

merce Committee at the close of last Congress. By way of explanation it will be remembered that Senator Jones presented a resolution last session calling on the Shipping Board to investigate and report to Congress plans for building a government owned merchant marine and for the promotion of a privately owned merchant marine. The Shipping Board's report was made to Congress and Senator Jones then prepared two bills which attempted to carry out the recommendations. These bills were lost in the legislative jam in the closing days of the Sixty-ninth Congress.

Only one of the several bills introduced by the Washington senator underwent any change in legislative status and that was the measure providing for a government owned merchant marine. That bill was reported favorably out of the committee and the report was made despite the fact that there were no hearings on the measure, and without any thought that it would be passed before Congress adjourned. In his report Jones said, "This bill is reported with the approval of practically every member of the Committee on Commerce. This does not mean that all, or even a majority of the committee, prefer government to private ownership, construction, and operation of merchant ships. It does mean that the members of this committee believe that, at least for a considerable time, the only way to secure an adequate merchant marine under our flag is through the government, and that they are willing to sink their personal preferences to attain an object vital to the public good."

Crisis Reached

It is conceded in Washington that a critical turn in the road has been reached in connection with the American merchant marine. It is generally felt that a most unfortunate situation exists in that the President of the United States and members of Congress presumed to be familiar with the subject are diametrically opposed in their views as to the future governmental merchant marine policy.

Legislation is usually a compromise, but this remote possibility offers no encouragement as the government's present method represents in reality a compromise between government operation and private ownership. It is not denied that this method has proved unsatisfactory, for although the government assists private operators by making construction loans for new ships and operating contracts with private operators on government owned ships, yet under this plan the government remains a competitor of the private operator, and practice has proved that the private operator is incapable of competing with his government, particularly when his government is willing to take a loss on operations in order to keep the ships running.

Newspaper Comment.

The majority of the eastern newspapers support the Coolidge program.

Commenting critically on the Jones bill the Washington Post had this to say, editorially:

"The fundamental policy of the United States as to leave the private enterprise all gainful occupations not directly connected with the government service. That is the rule as stated by President Coolidge in his Union League speech. He added that 'priv-

New Twin Screw Motor Tanker

Sun Shipbuilding and Dry Dock Company Building Fine Bulk Oil Carrier on Isherwood Bracketless System for California Petroleum Corporation

ON January 21, 1928, there will be launched at the Chester, Pennsylvania, yard of the Sun Shipbuilding & Dry Dock Company a twin screw motor tanker which is perhaps the most up-to-date vessel of her type yet built in America.

This vessel is building for the California Petroleum Corporation and has the following general characteristics:

Length between perpendiculars	510'0"
Length on water line	530'0"
Breadth, molded	70'0"
Depth, molded	40'0"
Draft, corresponding to 16,850 D.W.T.	29'6"

The hull is built on the new Isherwood bracketless system of ship construction, and is to have a designed loaded speed at sea of 11½ knots. As will be noted from the drawings herewith, the hull is built with cruiser stern, has a fine run aft on the underwater body, and is fitted with a balanced rudder of the latest type, this rudder being controlled by hydro-electrical steering gear operated by electrical telemotor from the pilot house installed by the American Engineering Company.

The propelling machinery is now under construction by the Sun Shipbuilding & Dry Dock Company, and consists of two sets of Sun-Doxford, opposed piston, oil engines of 2500 shaft horsepower each. The cylinders on these engines are 21.259 inches in diameter with a double stroke of 42.5 inches. These engines are fitted with electrical jacking gear and Kingsbury thrust bearings, and, as will be noted from the machinery arrangement plan herewith, they are set in a very compact arrangement well aft in the hull.

The engine room auxiliaries servicing these engines are practically all of the Worthington make and are electrically operated. Power for these auxiliaries and for the lighting of the ship is supplied by two Worthington 3-cylinder, 12½-inch diameter, and 13¼-inch stroke, 180-horsepower diesel engine generating sets.

For each main propulsion engine there are fitted two 12-ton fuel oil service tanks located outboard of the engines in the port and starboard wings of the engine room. Each pair of these fuel oil service tanks is served by a Sharples vapor-proof fuel oil purifier.

For cooling water for circulation in the pistons, a 2000-gallon cylindrical fresh water storage tank is used. This is located amidships underneath the engine room floor between the after ends of the engines, and is served by two electrically driven Worthington 4-inch, Type M volute pumps and an installation of Andale 10-inch duplicate strainers. Make-up water for this 2000-gallon fresh water tank is insured by the installation of a 2150-gallon fresh water storage tank on the second deck level amidships at the after end of the engine room.

Steam for heating the cargo tank coils and for operating the steam deck machinery and cargo pumps is generated by a Foster water-tube boiler equipped with Todd-White system oil burning equipment. Two vertical multi-tubular gas fired boilers are also installed for heating officers' and crew's quarters and for use at sea.

The deck machinery consists of three compound gear-

ed steam winches, four steam capstans, and a steam windlass.

All of the electrical equipment for the auxiliary machinery of this tanker is of Westinghouse manufacture. All motors are of the direct current type, working at 230 volts. These motors aggregate 370 horsepower.

The main cargo pumps are of the Worthington steam driven, compound, duplex, pot valve type, each 12 x 20 x 13 x 24 inches. These pumps are located port and starboard in the pump room and have both suction and discharges cross-connected in the usual manner followed in modern tanker design.

The heat exchangers, or "gas fired boilers" referred to above, are connected to the exhaust of the main engines, the exhaust being fitted with a by-pass valve arranged to run the gasses either through the exchanger or directly to the stack. These heat exchangers are constructed for a working pressure of 200 pounds and have a safety valve set at 100 pounds. They are connected up to the main water tube boiler in such a way as to keep the temperature of the water in that boiler hot enough so that steam may be raised on very short notice.

Lubricating oil is served by two rotary type pumps driven by 10-horsepower motors and each having a capacity of 250 gallons a minute against a head of 30 pounds. Two lubricating oil coolers are installed, each having a capacity of 200 gallons a minute. A pair of Sharples centrifugal oil purifiers take care of any foreign matter in the oil. These are in addition to the two already listed as serving the fuel oil service tanks.

Kolster radio direction finder or compass will be fitted on the vessel, also the latest model Federal arc type radio sending and receiving apparatus.

Commodious accommodations have been arranged for the crew and officers to take care of a total personnel of 49.

The captain has a stateroom and bath, office, and lobby on the boat deck under the navigating bridge.

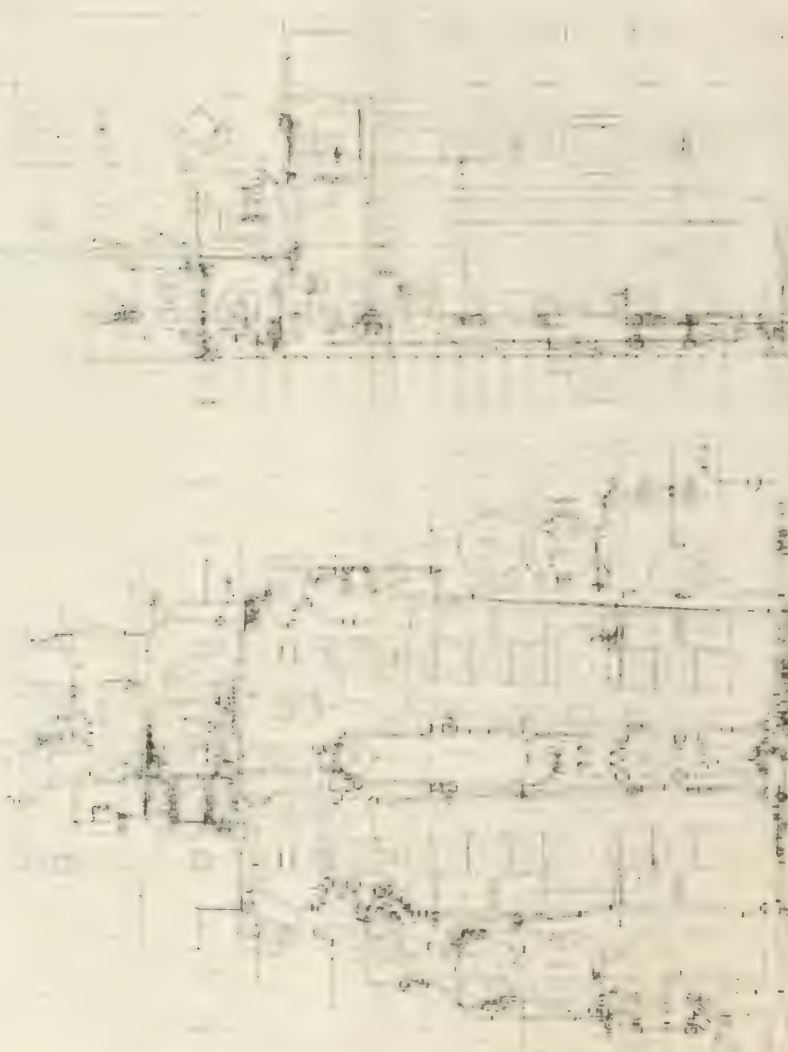
The deck officers, purser and radio operator have staterooms, two baths, pantry and dining saloon on the upper deck under the boat deck.

Aft on the upper deck, under the poop, there are quarters for all of the engine room officers and crew, steward and petty deck officers, together with galley, officers' mess, petty officers' mess, and crew's mess.

Seamen, firemen, wipers, and oilers are located in comfortable rooms of three berths each arranged on the second deck level above the engine room wings.

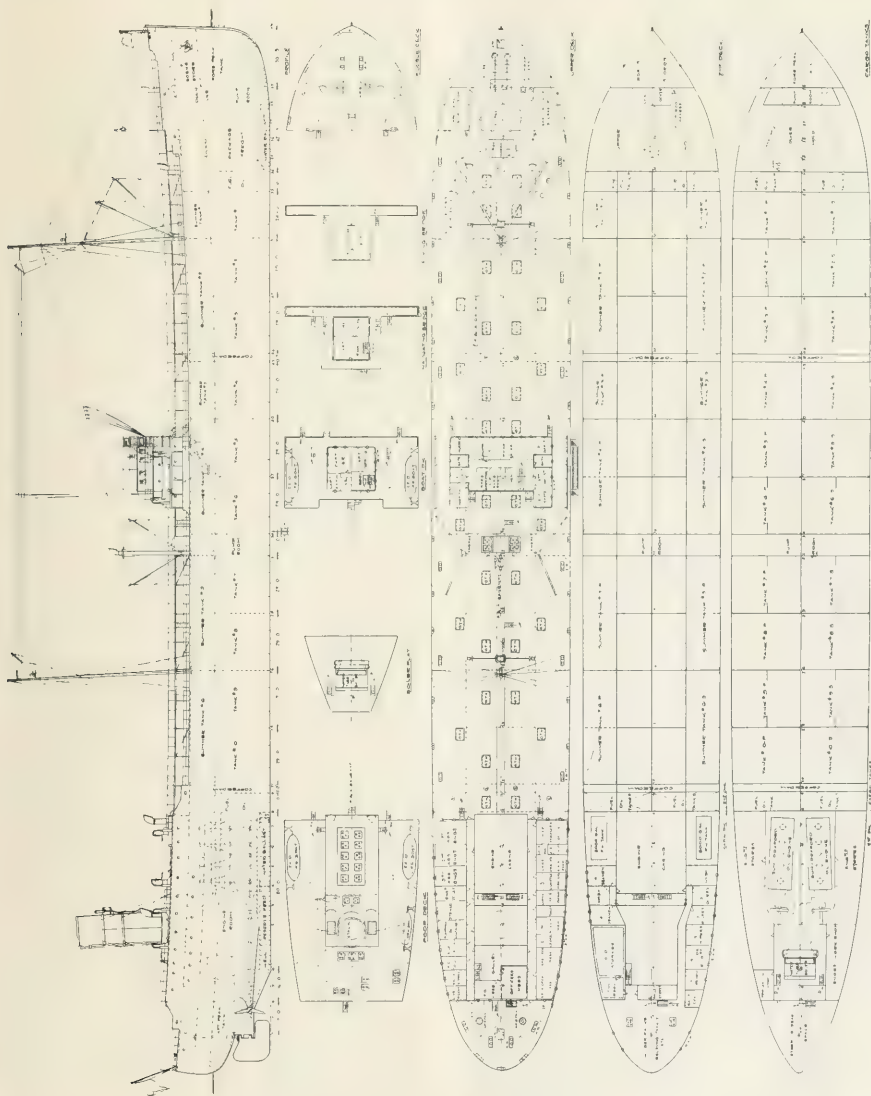
There is ample capacity fitted in refrigeration machinery, cold storage, and chilled rooms to take care of all necessary steward's stores for a long voyage. Ventilation and heat are provided for the individual rooms so that the crew of this tanker will be comfortable in all climates. Two 8000-gallon fresh water tanks provide drinking water, and a large evaporator capacity is provided for any make-up required.

Both hull and machinery were constructed under the personal attention and supervision of William L. Bunker, manager of the marine department of the California Petroleum Corporation, and the vessel is built to the highest requirements of the American Bureau of Shipping.



Elevation and plan of engine room and machinery arrangement on twin screw motor tanker.

New Tanker for California Petroleum Corporation



Profile and general arrangement plans.

New Fireboat for Seattle

Pacific Coast Engineering Company Delivers Alki After Successful Tests

DURING THE PAST few days the Alki, a brand-new fireboat, has been making her official trials on the Alki River. The boat, built by the Pacific Coast Engineering Company, is the first of its kind in the world. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler.

The boat is driven by triple screws, and is the first of its kind in the world. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler.

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at their forward ends. The screws are driven by a central propeller shaft, and drives the central propeller through a three to one reduction gear. The boat thus has ample propulsion power for a maximum speed and full pump capacity on arrival.

The monitor is built of steel, and is the first of its kind in the world. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler. It is a 100-foot-long, 20-foot-wide, 10-foot-deep vessel, built of steel, with a hull of 1/2-inch plate. It has a 100-horsepower engine, a 100-horsepower pump, and a 100-horsepower boiler.

The monitor is operated by hydraulic rams which are capable of lifting the monitor to a level of 40 feet above the water line. This tower, the electric windlass, the electric boat winch, and the hydro-pneumatic steering gear were furnished by Allan Cunningham of Seattle.



The Alki testing out her Dixon-Jackson fire pumps on her official trials on the Oakland Estuary.

Power for operating the hydraulically controlled valves, for raising and lowering the monitor tower, and operating the steering apparatus is furnished by a Type 9 HZ Northern rotary pump, which is driven by a 7½-horsepower Westinghouse marine type motor. This pump is capable of delivering 37 gallons a minute against a pressure of 250 pounds and is controlled by an automatic pressure switch so that there is ample pressure available at all times.

Gasoline is supplied to the overhead day tanks in the engine room by two Romec pumps driven by totally enclosed ¼-horsepower Westinghouse motors. Each of these pumps has a capacity of 14 gallons a minute, which is more than ample to take care of the engines when running at full load, leaving one of these units available as a standby. Both of these units and the hydraulic pressure pump were supplied by the San Francisco office of the King-Knight Company.

A complete wireless telephone installation, with a telephone number in the city directory, was installed by the Samson Radio Corporation of Seattle. The fire chief can thus direct the boat's movements and her fire-fighting activities from shore.

The auxiliary equipment is very complete. Two Byron-Jackson wrecking pumps, each of 1000-gallons-per-minute capacity, driven by modified Fordson gasoline engines, equip the craft for light salvage work. A 4 by 3½-inch Ingersoll-Rand compressor provides compressed air for pneumatic services. Current for lights and auxiliary power is supplied by two Westinghouse 15-kilowatt, 110-volt generators driven by modified Fordson gasoline engines.

Twenty Lux carbon dioxide cylinders are installed and piped so as to make possible the instantaneous smothering of any fire at any part of the boat. This carbon-dioxide system is equipped with 300 feet of flexible metal hose for fighting fire outside the vessel.

For warning signals and for navigation, a Duplex Denver siren, an Allan Cunningham whistle, and two Carlisle & Finch searchlights are fitted.

The Alki was designed by W. C. Nickum, well-known naval architect of Seattle. She was accepted and placed in commission by Fire Chief Mantor of Seattle and is under the command of Captain S. Rustad of the Associated Pilots of Seattle.



A group of officials at the launch of the fireboat Alki. Left to right: S. G. Plummer, manager, Pacific Coast Engineering Company; W. C. Nickum, naval architect of Seattle; J. C. Coney, president, Pacific Coast Engineering Company; and Fire Chief Mantor of Seattle.

No quarters for crew are provided on board the Alki, all available space being used for machinery and fuel supply. The crew of the boat will have quarters on the pier at the foot of Madison Street, Seattle, where the Alki is stationed. The Alki, as finished, represents

an investment of \$275,000.

The outboard propeller shaft bearings of the Alki are equipped with Cutless Rubber Bearings manufactured by the B. F. Goodrich Rubber Company and supplied to the boat by C. V. Lane of San Francisco.

Ellis Channel System of Hull Construction

THE Ellis Channel System of Steel Hull Construction was established by Edgar Ames, veteran shipbuilder and organizer, who opened the home office in New York in 1925. From here the System has been rapidly pushed. After a little over two years, it is established on the Atlantic Coast, on the Great Lakes, on the Mississippi, and on the Pacific Coast. Some forty-five hulls for various types of services have been built or are under order by leading corporations, such as the New York Central Railroad, Raymond Concrete Pile Company, Merritt-Chapman & Scott Corp., Ltd., Anaconda Copper Company, E. E. Gillen of Milwaukee, Pacific Telephone & Telegraph Company, Red D Line, and others, as well as by the United States Government.

The Manitowoc Shipbuilding Company at Manitowoc, Wisconsin, is building two Ellis Channel Steel barges for the United States Government. The government received bids on the barges for both plate construction and Ellis Channel construction. Six yards quoted on

plate, three of which also quoted on Channel. The average price quoted for plate construction was \$23,710, and the average price quoted for Channel was \$21,936.

The New York Central was the first important owner to use the System. Its first order was ten barges. These have been in use over two years in New York Harbor service. They have been followed by a second and third order, the last being a pile driver barge. A number of pile driver barges have also been built for E. E. Gillen Company and the Raymond Concrete Pile Company. A half dozen well known yards have taken most of the orders so far, including Newport News Shipbuilding & Drydock Co., Atlantic Works, Boston; Jones & Laughlin, Pittsburgh; Midland Barge Company, Midland, Pennsylvania; E. E. Gillen Company, Manitowoc Shipbuilding Company; and the Wallace Yards, Seattle.

Preliminary plans for dredges, derrick barges, oil barges, sand and gravel barges, and lighters are being made for various interests.

New Fireboats for Portland

David W. Campbell Completes Successful Trials of Her Sterling Byron Jackson Propulsion and Pumping Equipment

DAVID W. Campbell, first of the new fireboats built for the City of Portland, has just completed the first successful trial of the propulsion and pumping equipment. The trial was conducted by the City of Portland, and the results were most successful. The trial was conducted by the City of Portland, and the results were most successful.

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Each boat is driven by two 8-cylinder engines of the type Viking II engine of the Sterling type. The engines are 8-cylinder, 8-inch bore, with a 9-inch stroke, and the flywheel end of the engine is connected to the propeller shaft. The engines are fitted with a jaw clutch permitting connection to the centrifugal pump. The engines are fitted with a jaw clutch permitting connection to the centrifugal pump.

The pumps were constructed by Byron Jackson Pump Manufacturing Company, and the capacity of each pump is 1,200 gallons per minute against 200 pounds pressure; but on the trial of the David W. Campbell an average of 10,005 gallons a minute was distributed against 200 pounds pressure during the four-hour period of the test. The connections on the boats are such that all of the water can be put through one 6-inch nozzle. There are also five 3½-inch shore connections at each end of the vessel for taking water ashore, so that this gallonage can be distributed through ten lines with valve manipulation. The



The engine room of David W. Campbell.

characteristics of the pumps are such that they will deliver 7200 gallons per minute against 200 pounds pressure.

The pumps are fitted and are of the special Byron-Jackson fireboat pump design. They are of the 1-stage ball-bearing Multiplex Centrifugal type. All pump parts are interchangeable.

There is a water curtain under the pump and the pump is

around the boat and mounted on the engine room. The trial was conducted by the City of Portland, and the results were most successful. The trial was conducted by the City of Portland, and the results were most successful.

As the trial was conducted by the City of Portland, and the results were most successful. The trial was conducted by the City of Portland, and the results were most successful.

When completed these three boats will form a very efficient and economical extension of Portland's fire department to more prompt and adequate fire protection along the river fronts. The crew of each boat will consist of six men, and the cost of maintenance will be much less than a steam fireboat due to the smaller crew and to the fact that there is no standby fuel consumption.

Since the lead to this article was written and printed, the two companion boats of the David W. Campbell have been practically completed and have been named. The second of the two boats, the Mike Lau-

writers' test and has been found, like the David W. Campbell, to exceed her rated capacity. The boat was put in commission on the 31st day of December.

The Carl Gunster, third of the trio, is expected to have completed her trials and to go into commission about the 10th of January.

This fireboat program will cost Portland approximately \$300,000. When the three boats are completed it is proposed to have an illuminated night drill on the Willamette river as part of a program in honor of Fire Chief Lee G. Holden.



Portland's new fireboat David W. Campbell.

TEST OF FIRE BOAT "DAVID CAMPBELL"

TIME	STARBOARD PUMP NO 36236		PORT PUMP NO 36237		STARBOARD PUMP NO 36238		PORT PUMP NO 36239		HEADER PRESSURE AS PUMP AVERAGE PRESSURE	TOTAL CAPACITY
	PUMP SPEED (R.P.M.)	PUMP PRESSURE (LBS.)	PUMP SPEED (R.P.M.)	PUMP PRESSURE (LBS.)	PUMP SPEED (R.P.M.)	PUMP PRESSURE (LBS.)	PUMP SPEED (R.P.M.)	PUMP PRESSURE (LBS.)		
10:10 A.M.	1140	201	1150	200	1140	196	1165	198	199	10,060
10:45 A.M.	1140	203	1160	202		203		202	202	10,060
11:00 A.M.		204		201		203	1146	201	202	10,020
11:15 A.M.		200		201		203		201	201	9,990
11:30 A.M.	1140	201	1140	201	1198	201	1155	201	201	9,990
11:45 A.M.		201		201		201		201	201	10,000
12:00 A.M.		201		201		201		201	201	10,000
12:15 P.M.		201		201		201		201	201	10,010
12:30 P.M.		201		201		201		201	201	10,020
12:45 P.M.		201		201		201		201	201	10,030
1:00 P.M.		201		201		201		201	201	10,020
1:15 P.M.	1140	201	1150	201	1185	201	1160	201	201	9,980
1:30 P.M.		201		201		201		201	201	9,990
1:45 P.M.		201		201		201		201	201	9,980
2:00 P.M.		201		201		201		201	201	9,980
2:15 P.M.		201		201		201		201	201	9,980
2:30 P.M.		201		201		201		201	201	9,980
AVERAGES		201		201		201		201	201	10,005

DATE OF TEST: DECEMBER 8, '24

SIGNED

C. S. O'Leary

 RECEIVED BY THE BUREAU OF THE COAST AND GEODETIC SURVEY
 U.S. NAVY DEPARTMENT
 WASHINGTON, D.C.

Fire Chief Holden retired from office on January 1, 1928, after 30 years of faithful service in the Portland Fire Department. For the past several years he has been working for the adoption of the pro-

gram that is consummated in the completion of these three fireboats for the protection of waterfront property along the Willamette and the Columbia.

Electrical Science Solves Navigation Problem

HOW modern science, through the development of electrical echo depth sounding, has solved one of the greatest problems of ocean navigation, is told in the annual report of E. Lester Jones, director of the United States Coast & Geodetic Survey, which has cooperated actively in the perfection of this instrument.

The report of the Coast & Geodetic Survey describes its experience with the Fathometer as follows:

An outstanding accomplishment during the past year in which this bureau has played an important part has been the perfection of an echo-sounding machine. During the last few years engineers and scientists in Europe and in the United States have been working on apparatus for measuring ocean depths in terms of time required for a sound wave to travel from near the surface to the bottom and the echo to return to the surface.

Some two years ago an apparatus of this kind was devised by an American company and gave such promising results on an investigation by officers of the Coast and Geodetic Survey that this bureau decided to cooperate with that com-

pany in perfecting the apparatus. One such machine was installed on a vessel of the survey, and subsequently extensive experiments and tests have been made resulting in improvements and refinements which have corrected the defects

in the original apparatus. During the last year the apparatus successfully passed all tests and was accepted for use in hydrographic surveys.

By means of this echo-sounding apparatus, known as the Fathometer, it is possible without stopping the vessel to take soundings in any depths from a few fathoms under the keel to at least 2500 fathoms (15,000 feet), and probably to greater depths. The advantage of this apparatus for survey service is that soundings can be taken as rapidly as desired—as frequently as four per second—with the vessel steaming at full speed.

While the primary purpose of this bureau in going into this subject and cooperating with a commercial firm in the development of the Fathometer was to secure an apparatus that would enable the bureau to speed up its hydrographic surveys, it was, nevertheless, influenced by the belief that the perfection of this apparatus would be of great benefit to mariners everywhere and would contribute toward greater safety at sea. "I am glad to report," says Mr. Jones, "that our estimate of this apparatus has been fully justified, and that our cooperation has been of material assistance in bringing to perfection a very important contribution to navigation."

The Fathometer is manufactured by the Submarine Signal Corporation of Boston, which is represented on the Pacific Coast by Hibbs, McCauley and Smith of San Francisco.



Engine and pump room of the David W. Campbell. Four Sterling engines, developing 1980 horsepower at normal rating.

Cutter Northland Completes First Alaskan Cruise

NOVEMBER twenty.

NOW THE PLOTLINE OF THE book about the 1960s is clear. Congress passed legislation authorizing the Strategic Arms Limitation Treaty. The book says the Soviets will have a nuclear advantage over the Americans because of a "missile gap" and that the Americans must negotiate with the Soviets to close the gap. The book says the Americans must negotiate with the Soviets to close the gap. The book says the Americans must negotiate with the Soviets to close the gap.

[illegible]

Without doubt, the hull of the Northland carried into the Arctic waters the most modern equipment that the Alaskan Fur North has ever seen. It is therefore especially gratifying to all the progressive marine fraternity to know that these changes have not been accompanied by any decreased reliability of the vessel.

Always known as the finest sailor men in the world, the cruise of the Northland, to her officers and men, has been nothing out of the ordinary. A peep into her log, however, would soon excite the interest of the most phlegmatic. Little imagination is required to expand its laconic entries, officially and nautically phrased, into chapter upon chapter of marine romance. There was the destitute native Indian in Seattle who yearned for his native Prince of Wales Island. He was given a lift. An army post got a dispatch through to the cutter that its lighting plant was disabled and material was sent to replace it. The cutter was sent to the rescue. (A situation where the Arctic night approaching!) Out of her way goes the Northland and the army post is fixed up.

In Oakland there is a mother who cherishes the memory of a son who died on one of these cruises and whose Northern grave twenty-one years ago received his body. She delivered a wreath to the Northland before she sailed with the request that it be placed on her son's grave. This was done with appropriate ceremonies. A

From readings taken at 150
Crest Green, the area under the
sea surface.

[illegible]

green, got under way for the stricken pair six hundred miles away. Treatment was continued on arrival and

personnel transported from place to place included
in items 1-5. Empty fuel tank, engine, fuel tank,
and government officials. There are no other items
that can be carried by the company.

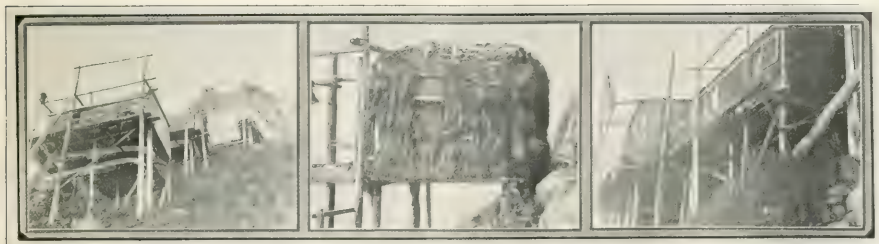
One morning during heavy snow squalls, the ship
officer in a surf boat some two hours later located an
American steamer. Two hours in a snow squall in a
surf boat is nobody's particular picnic. Investigation
disclosed that the steamer had no charts of that
locality and was seeking a port of refuge, so the officer
piloted her into an anchorage. There were a number
all her crew except five were given passage South—
destitute seamen.

From several hundred miles to the northward came a radio one morning that a small freighter was in trouble. This little fellow was the last who had remained in this latitude with the intention of getting out this season. Up comes the Northland's anchor and through the tail-end of a northerly gale that disputed every mile of progress, the cutter ploughed her way to the freighter.

Information reached the Northland that volcanic activity in the vicinity of Bogosof Island had existed during the past summer, so advantage was taken of an opportunity to digress for investigation. She found what at last accounts had been a channel for vessels from the Gulf of Amudarya and a spot, the harbor, completely gone. A new peak nearly 200 feet high had also arisen from the ocean floor. Checking the charted position of the island showed it to be in error some four miles in latitude and one mile in longitude.

Last year the Coast Guard went into the Arctic with the Bear of beloved memory—a wooden ship manned by iron men. This year the ship was of iron but men do not change their fibre in one year. The same iron men provided with modern equipment of the highest grade have increased the sphere and range and usefulness of the Coast Guard Service, a service which practices the most beneficent and efficient paternalism to be found in any branch of our government.

Snapshots on Northland's First Cruise



A few samples of the summer homes of Uncle Sam's wards in Alaska.



The Bishop.



Quartering view of the Coast Guard cutter Northland.



Two of the bishop's parishioners.



At left: A volcanic island which has blocked an old channel. Center: Cutter Northland at dock in Unalaska. Right: Eskimo fishermen in dug out canoe.

First, if an adjustment in pitch is anticipated, the designed pitch of the propeller should be on the low side, so that the blade will have to be turned up rather than down. Second, for moderate changes in pitch, resulting efficiency and revolutions can be closely approximated by assuming the propeller to have a constant pitch equal to that at two-thirds the radius.

Tank Steamer Fires and Explosions, by Robert L. Hague. This very practical paper by the manager of the Marine Department of the Standard Oil Company of New Jersey, states in non-technical, simple terms the characteristics of crude petroleum and their refined products which give rise to the danger of fire and explosion on tank steamers, and describes causes of fires and the rules and practices for making tankers safe from the fire menace. The first two paragraphs show in a very striking way how safety work has justified itself in the world's tanker fleet, and are well worth quoting.

"During the period of nearly five and one-half years from January 1, 1922, to May 1, 1927, the world's tank steamer tonnage afloat averaged almost exactly 8,000,000 deadweight tons. There were transported in that period 135,000,000,000 gallons of petroleum products in bulk, across 225,000,000 miles of ocean. This is an average of 135 gallons per minute for every minute since the birth of Christ.

"Against this all but incredible record of performance the aggregate number of fires and explosions in tank steamers, whether loading or discharging, undergoing repairs, or in free route at sea, has been but fifty-seven, or the remarkably small amount of thirty-two one-hundredths of 1 per cent (.32 per cent) of all the marine casualties reported during the period, which numbered in excess of 17,600."

What Is Naval Aviation Doing?

by Captain E. S. Land, assistant chief of the Bureau of Aeronautics, Navy Department. The captain says the answer to this question is simple, namely, "Playing the Game." He then goes on to show what the Aeronautics Bureau of the Navy has done in the way of development of engines, engine accessories, special metals, starters, landing gears, and safety devices. The paper is illustrated with pictures of various types of planes and their equipment.

Test of Pulverized Coal as Applied to Scotch Marine Boilers, by

Carl E. Jefferson, head of the Fuel Conservation Section, U. S. Shipping Board, and Commander Joseph S. Evans, U.S.N. This paper is a brief report of the 240-hour test of the system developed by the Shipping Board for burning powdered coal under Scotch marine boilers and which has since been installed on the 9700-ton freighter *Mercer*. In 1920 the Fleet Corporation had attempted to utilize pulverized coal in this way with unsatisfactory results. Since 1920 improvements in pulverized coal installations have made it possible to get good results with much shorter length of flame; and more recently the Peabody Engineering Corporation has developed a system which gave so much promise that the Shipping Board undertook this 10-day test when for periods of 48 hours each, following each other without interruption, combustion rates of 1200, 1400, 1600, 1800 and 2000 pounds per hour were maintained. The paper presents the data derived from this test to the engineering profession in the hope that further development work along this line will be stimulated.

Pulverized Coal Tests of a Marine Water-Tube Boiler, by Thomas B. Stillman. An account of tests carried on during the past few months by the Babcock & Wilcox Company working with a Babcock & Wilcox marine water-tube boiler. The following conclusions were reached:

1. If proper care is taken in the design of the burners, pulverized coal may be burned efficiently at the high combustion rates necessary under marine boilers when the furnace volume is small in relation to the heating surface.

2. The fusing point of the ash in the coal should be above the average flame temperature, or the resulting ash in the furnace and on

the tubes will be a source of shutdown.

3. To obtain the full benefit in efficiency from burning pulverized coal, the auxiliary power in the ship should be generated in the most efficient manner possible.

4. When used with water-tube boilers, pulverized coal installations do not need oil as an auxiliary fuel.

5. Because of their dependability and improved quality of the coal output, ball mills are to be preferred to the impact or hammer type for marine purposes.

6. In general, there is no reason why pulverized coal should not be used aboard ships provided certain precautions are taken to insure safety, dependability, convenience of operation and reasonably high overall efficiency.

Tests of a Two-Cycle, Double-Acting, Marine Diesel Engine, by Ernest Nibbs and Stephen A. Gardner. An illustrated description of the official tests of the 4-cylinder, 2-cycle, double-acting, 3680-brake horsepower M.A.N. type marine diesel engine built by the New London Ship and Engine Company for the United States Shipping Board and later installed in the steamship *Wilcox*, a 9500-ton deadweight vessel of the Oscar Daniels type. This engine was subjected to a very severe 30-day nonstop run and came through with flying colors. Full data are given showing temperatures, power readings, fuel characteristics, and various pressures.

Diesel Engines for the Navy, by Edward C. Magdeburger. A masterly review of the present use of the diesel engine in the world's navy and an analysis of the practicability of much larger application of the diesel for naval work, particularly in relation to oil engine driven generator sets for auxiliary machinery.



U. S. Army transport *Somme* at her dock, San Francisco.

In the Engine Room

A Department Devoted to Marine Engineering from the Standpoint
of the Operating Platform

Boiler Feed Water

By A. G. Elliott

THE efficiency of a steam boiler depends to a great extent upon the water which is fed to it. If the surface water in the boiler is too high and too much heat is applied, then scale forms on the heating surfaces and corrosion takes place on exposed parts of the boiler. Scale is an insulator and it keeps the transfer of heat from the furnace to the water. Also it hastens the attack of the furnace by making it impossible to maintain the temperature necessary to keep the boiler running at the rated capacity.

If the water in a boiler is too low, then the water in the boiler must be supplied with fresh water to replace what the steam takes away. This is done by a feedwater pump. The pump is driven by the engine and it forces the water into the boiler at a pressure which is higher than the pressure in the boiler.

A knowledge of the composition of the water and their reaction in the boiler is of great importance to the engineer in order to prevent scale forming and corrosion taking place. The water which is fed to the boiler is usually drawn from the sea or from a river. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive.

In general, the water from the sea is very hard and it is very corrosive. The water from a river is usually very soft and it is not so corrosive. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive.

The principal scale-forming salts found in fresh water are the carbonates of lime and magnesia. The waters in which these salts are found is termed "hard." The hardness varies with the quantity of the impurities contained in the water.

Corrosion in the boiler is largely due to the air and gases admitted to the boiler in the feed water. Water absorbs air and gases at ordinary temperatures, but at a temperature of around 212 degrees Fahrenheit they are thrown off. This fact makes it easy to extract the air and gas from the feed water after it has passed through the heater and before it enters the boiler. A valve fitted on the highest point of the connection through which the water leaves the heater, with a pipe run back to the feed tank, will drain most of the air out of the feed water. Extracting the air is half the battle in preventing corrosion in the boiler.

Various salts and acids present in impure water have a corrosive effect, principally the chlorides of magnesium, calcium, and potassium; chloride of sodium

chloride; and, in addition, the impurities in general in the water.

There are two main causes of corrosion in the boiler. One is the action of the acids and the other is the action of the salts. The acids are formed by the action of the water on the boiler. The salts are formed by the action of the water on the boiler. The acids are formed by the action of the water on the boiler. The salts are formed by the action of the water on the boiler.

When the boiler is filled with water, there is a certain amount of air in the water. This air is oxidized by the action of the water and it forms a scale on the heating surfaces. This scale is very hard and it is very corrosive. The water in the boiler is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive. The water in the sea is usually very hard and it is very corrosive. The water in a river is usually very soft and it is not so corrosive.

Carbonate of soda, or boiler compound containing soda, has the property of changing the hard sulphates into the soft carbonates; what would be a hard scale on the heating surfaces into a soft sludge.

In addition to its effect on the scale-forming salts, soda will keep the boiler water alkaline.

A constant warning of the condition of the water in the boiler may be seen in the gauge glass. If, when blown through, a red or black sediment shows, it is certain that the water is corrosive. A dirty straw color indicates that the water is near the danger point.

When using a very soft natural water, such as the Puget Sound cities supply, acidity must be guarded against. These waters contain little else than the acids that collected in falling through the air. The impurities contained in any city service or river water varies with the season, or even daily. A cloudburst in the mountains or a river in flood may bring new impurities or alter the proportion of those already in the water. An analysis is given as an average only. For example, the Puget Sound country city supply will average:

Salt	0.06 grains per gallon
Oxide of iron	0.03
Sulphate of iron	0.51
Chloride of calcium	0.08
Chloride of magnesium	0.19

Chloride of sodium....	0.51	"	"
Organic matter	0.76	"	"

and is a soft water which must be treated to neutralize the acids and render it slightly alkaline.

A harder water, such as the San Francisco city supply, containing an average of 7 grains per gallon, principally carbonate of lime, requires soda treatment to change over the lime to soda carbonate. When the water hardness is due to lime impurities, it will turn acid when it is heated, because the lime is thrown out of solution, as before stated. Soda must be used to turn and keep the water slightly alkaline. The alkalinity should be kept low, as excessive alkalinity may form soda cracks on the surface of the plates and around the seams. Leakage at the longitudinal seam may be due to excessive alkalinity of the water in the boiler. It is claimed that with San Pedro water, which is highly alkaline, soda cracks will occur unless close attention is given to the water treatment.

To test the boiler water for acidity or alkalinity the following chemical solutions and apparatus are required. They may be purchased in any chemical supply house for a few dollars.

- 1 liter of one-half normal nitric acid solution;
- 100 cubic centimeters distilled water in which is dissolved 1/10 gram methyl orange crystals;
- 1 burette, 50 c.c. capacity, graduated in 1/10's of a c.c.;
- 1 test tube, 100 c.c. capacity, graduated in c.c.;
- 1 porcelain dish, 100 c.c. capacity;
- Red and blue litmus papers.

To make a test, take 50 c.c. of the water in the porcelain dish and add two drops of the methyl orange solution. If the water is alkaline or neutral it will turn a pale yellow when stirred. If it turns pink the water is acid.

Suppose it turns yellow. Then fill the burette with the nitric acid solution to any mark, say 40, and make sure that the solution has displaced all the air in the small cock. Open the cock on the burette and allow the acid solution to run, drop by drop, into the sample of water until it turns a light pink, while being well stirred. Each 1/10 c.c. of the acid solution used indicated that the water is 1/10 of one per cent of normal alkaline strength. If the boiler water is kept between 1/10 and 5/10 of one per cent of normal alkaline strength serious corrosion cannot take place in the boiler.

To distinguish between lime and salt impurities in the boiler water, take half a test glass of the water and the acid solution until it turns acid, test the water with a piece of blue litmus (acids turn blue paper red). Add a solution of silver nitrate (4.1 grams of silver nitrate crystals dissolved in one liter of distilled water). If a pure white powder forms, salt is present. If nothing takes place, take another sample of the water without the acid and add the silver nitrate solution. If a dirty white to brown powder appears, lime is present.

The salinity of the boiler water and the condensate can be determined by the nitrate of silver solution. Measure 10 c.c. of the water in a test tube, add a drop of a potassium chromate solution (1 gram of pure potassium chromate dissolved in 150 c.c. of distilled water). With a dropper add the silver nitrate solution drop by drop until the water keeps a faint pink color while being well shaken. Each three drops of silver nitrate solution used indicates that the water contains one grain of chlorine per gallon.

This test indicates the chlorine content, not the total solids held in solution in the water, as does the salinometer. The following table gives the equivalent

ounces, grains of chlorine, and the grains of the solids as indicated by the salinometer per gallon of water.

Ounces per Gallon	Chlorine Grains per Gal.	Solids Grains per Gal.
5	1325	2220
	1250	2060
	1200	1980
	1150	1900
	1110	1810
4	1065	1760
	1050	1735
	1000	1650
	950	1565
	900	1485
	850	1400
3	800	1320
	750	1237
	700	1155
	650	1070
	600	990
	550	905
2	532	880
	500	825
	450	743
	400	660
	350	580
	300	495
1	265	440
	250	415
	200	330
	150	245
	100	165
	50	80
	25	40
0	0	0

In some testing sets, the test tubes are graduated to indicate the grains of chlorine per the United States standard gallon, which contains a little over 4 ounces of solid matter held in solution. The salinometer is graded to the British Standard of 10 pounds per gallon.

It is customary when the ship is in fresh water to fill the double bottom tanks, and if possible clean and fill the boilers as well. Very few ships pass through Gatun Lake without flushing their double bottom tanks. Canal officials warn against using this water for domestic purposes, but, with proper treatment, it does very well when used in the boilers. It is a soft water containing much organic matter. It should not be taken into the tanks until the vessel is well clear of the mouth of the Chagres river.

Valparaiso (Chile) has a medium hard water which is very difficult to keep at a low alkalinity, if much make-up feed is used. It contains:

Silica	0.36 grains per gallon
Oxide of iron.....	0.10 " "
Carbonate of lime	2.61 " "
Carbonate of magnesia	1.75 " "
Carbonate of sodium.....	2.12 " "
Sulphate of sodium	0.26 " "
Chloride of sodium	0.85 " "

It has been stated before in this article that River Plate water should be used with extreme caution. There is one place in the river—Banco Chico—where good water may be had, and many ships fill their tanks there. The water is clear, but when taking the water chlorine tests should be taken every five minutes, as the water changes very rapidly. Carbonate of lime is the principal impurity held in solution. It is an alkaline water which changes to acid in the boiler.

Buenos Aires city supply water is about the same as the river water; about the only difference is that the

indicated by a reading of 1000 ohms. When this value has been reached, both ends of the coil, by a slip switch, may be connected in series to measure the resistance with both brushes.

Amazon River water contains, in 100 cc.

Iron	0.54 grains per gallon
Aluminum	1.00 "
Calcium	1.00 "
Calcium of Magnesium	1.00 "
Calcium of Sodium	1.00 "
Calcium of Potassium	1.00 "

When used in the boiler, it forms a hard scale which is easily removed. The soft scale, however, is not removed by the steam and will not.

When using water from rivers, streams, or lakes, which are not chemically treated, it must be kept in mind that the water is not properly filtered and is not pure. It may be only drinking water.

It can be proved, water should not be taken at Lake Superior or at Montreal.

Alumina	1.00
Sulphate of lime	1.00
Sulphate of iron	1.00
Sulphate of sodium	1.00
Sulphate of potassium	1.00

It is not necessary to use a good quality of boiler water. The evaporator and extract as much as possible of the air and gases from the feed water before it enters the boiler. If this is done, water is used in the boiler without passing through the evaporator, a thick hard scale will be formed on the heating surface.

The water is also very pure in the boiler. New York, Philadelphia, and Baltimore city service are all better and with less treatment very little scale is formed.

Testing Direct-Current Armatures for Trouble Without the Use of Expensive Instruments and Equipment

By J. M. Dodds, General Electric Company

WHEN trouble is experienced on a direct-current armature it is usually caused by one or more of the following:

- A—Shorted coil;
- B—Grounded coil;
- C—Coils open;
- D—Shorted and grounded coil;
- E—Open and grounded coil;
- F—Two commutator coils connected together;
- G—One commutator coil tapped out; and
- H—Complete burnout.

Trouble Located Visually.—In the majority of cases of trouble experienced with direct-current armatures, the seat of the trouble can usually be discovered by visual inspection upon removing the armature from the motor. Obviously, then, if appreciable insulation has charred and brittle insulation throughout the armature which, of course, results in a testing that indicates itself the seat or seats of the coils showing charred or brittle insulation, the remaining of the armature being intact. This, of course, means that the coils in question have been shorted on themselves or with each other, giving rise to a heavy circulating current, burning out the coil. Items A, B, D, and E usually give visual evidence at the spot where the trouble occurs. A hole may be burned in the copper or the iron, or both, where the shorted or grounded current has caused the

trouble. This hole may be serious enough to open the coil entirely, in some cases burning the coil free from the armature. In other cases, welding the coil to the ground. Item C is relatively uncommon, but when found is usually located in the soldered connection between the ends of the coil and the commutator risers and the commutator, which are easily inspected. There are a good many cases, however, which cannot be diagnosed by inspection and in these cases the following equipment and procedure may prove helpful.

Testing Equipment.—A testing outfit may consist of the following:

- 1—Telephone headset or receiver, approximately 75 ohm resistance;
- 2—Storage battery or set of dry cells;
- 3—Insulating board for the storage or dry battery voltage;
- 4—Exploring coil.

The exploring coil can easily be made up from a bar of $\frac{1}{2}$ -inch iron bent into the shape of a horseshoe approximately $2\frac{1}{2}$ inches long with two ends of the bar approximately 1 inch apart, and by winding approximately 1000 turns of small magnet wire on one or both legs of the horseshoe suitably insulated and taped up.

Tests Indicating No Trouble.—The storage battery and buzzer should be wired in series with each other and with a pair of leads call-

ed "excitation leads," which should terminate in suitable bare copper wire terminals for easily and quickly placing on different parts of the armature. The receiver should be wired up between a pair of leads called "test leads," which should also terminate in a pair of convenient bare copper terminals. Placing the excitation leads diametrically opposite each other on the commutator bars should operate the buzzer. By placing the test leads on the commutator bars, one lead on one bar and the other lead on an adjacent bar, a buzz should be audible in the receiver and careful note made of the volume and character of the sound. Next the test leads should be moved from bar to bar around the commutator, keeping the two leads on bars adjacent to each other. The volume and character of the sound received in the receiver should be approximately the same on every position of the commutator if the armature is in good condition. Variation in this sound indicates trouble in the armature as explained in the following paragraphs.

Test Indicating Shorted Coil.—The equipment should be connected and procedure followed as indicated in preceding paragraph.

A shorted coil will be indicated by a materially reduced volume of sound in the receiver. The shorted coil will be found connected to one of the commutator bars upon which the test leads are placed. This is

Deck plan of 110-foot seagoing cruiser yacht for Mr. and Mrs. Baron Long.

be featured on the bridge. Wireless receiving and sending apparatus will keep crew and guests in constant touch with the rest of the world afloat and ashore. Large fuel and fresh water tanks will permit long sea trip. The cruising radius with full tanks is 5000 miles.

An auxiliary diesel driven electric light plant, independent of the generator on the main engine, will be provided. This will be of 2 kilowatt capacity at 110 volts. It will be supplemented by a bank of Edison storage batteries of 225 ampere hours output.

The vessel was designed by Manuel Madrugá, who is superintendent of hull work for the yard. Details have been well worked out. It is the opinion of Baron Long that other vessels of this type will be built as soon as his new yacht goes into commission. He also believes that they will in all likelihood be built in San Diego, as the excellence of the job should give that port first call at such work.

A. R. Robbins Marine Engine Works of San Diego has laid the keels and started the framing on two new vessels. One, 100 feet in length, is for Captain Frank Silva and will be used in the Mexican Coast fishing trade. She will be fitted with up-to-date improvements, including an above deck bait tank. Her engine will be an Atlas Imperial 300-horsepower diesel, the contract for this having been signed a short time ago.

The other vessel will also be used in the Mexican Coast fishing business and will be operated by her owner, Captain M. Cravellio. She will be 85 feet in length and will be powered by an Atlas-Imperial diesel of 200 horsepower.

Mr. Robbins reports a fair run of work on general repairs to hulls, with quite a number of installations of the Robbins diesel built by the firm. These units, of from 20 to 60 horsepower, are giving good satisfaction to their users. One of

the 20 horsepower type was on exhibition at the Motorboat Show lately held in San Diego and, as it was operating under working conditions, attracted considerable attention from small boat owners.

San Diego Marine Construction

A Work Yacht

A COMBINATION of workboat and yacht might appear a bit strange, but it has advantages. So thought Dr. H. C. Watkins, of Hoquiam, Washington, when he ordered the Astoria Ship Building Company to construct for him a sturdy 65-foot craft, with a beam of 17 feet and depth of 7 feet. He at the same time specified that an Atlas-Imperial diesel engine of the 6-cylinder, directly reversible, 140-horsepower type be installed.

Several features have been worked into the Ruth E. to make her easily handled and comfortable. The main cabin is aft and above deck and so laid out that a direct passage can be had from fore to aft without going out on deck. Stairs lead to sleeping quarters below, forward, as well as to the engine room. The sleeping quarters are remarkably roomy, finished in teak, with every possible modern convenience in the way of sanitation, ventilation, and heating.

Just aft of the deckhouse is a set of heavy towing bitts, and aft of these is a fish hold, permitting the Ruth E. to go into outside fishing business if desired. And it is the doctor's plan to have her operated as a fishing vessel during seasons, so that instead of being a steady liability, as most yachts are, she can earn a dividend. Outside of the doctor and his family there will be but one more in the boat's company. This will be Captain Fred Pratsch, an Aberdeen boy, holding master's license, besides being familiar with diesels.

A unique idea in handling the

Company has of late been engaged in repair work, mostly on the fleet of the Star and Crescent Co., of which it is a subsidiary. The company have not entered into new work for some time, though the yard is well equipped for it.

vessel, both the steering and engine control, has been worked out in the Ruth E. Besides the pilot house controls usual in such a craft, she also can be handled from the cockpit. It is believed that this is the first instance of a heavy duty 140-horsepower diesel being handled from either pilot house or aft as desired.

The Ruth E. has three fuel tanks of 3000 gallons aggregate capacity, giving her a cruising radius of 5000 miles under power. Three watertight bulkheads divide the hull into four watertight compartments. Teak is most liberally used on the deck as well as in the cabin fittings. An Allan Cunningham electric windless is installed, and below, in a specially ventilated and arranged compartment, is a bank of Exide batteries of 270 ampere hours capacity at 120 volts. A 10-k.w. generator is driven from the main engine. An Atlas-Imperial air compressor, and bronze pumps for bilge, fire, and deck purposes integral therewith, are also driven from main engine. This unit is arranged so that the pumps can be used to take water from alongside and discharge it either overboard or into the vessel, a most convenient arrangement when watering ship in outside ports. A barge or other leaking craft can also be pumped out by this system, making the Ruth E. also a capable salvage vessel. All through the boat salt water pipes are brass of extra heavy gauge. The steering gear is of the well-known Johnson and Fries make, arranged for control from several points.

San Pedro Notes

At Larson's Yard at San Pedro, the Pacific Marine Review recently visited the yard where the Standard II, a 35-foot-long, 11-foot-beam, 7-foot-deck fishing vessel, is being built. The Standard II is a 165-horsepower diesel engine, and will be built in the yard where the Standard II is being built. The Standard II is a 165-horsepower diesel engine, and will be built in the yard where the Standard II is being built.

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The new vessel, Standard II. This boat is 35 feet long, 11 feet beam, 7 feet deck, is driven off motor and has a 165-horsepower diesel engine. She is owned by J. L. Long, Japanese fisherman of San Pedro.

The Harbor Boat Building Company, located at the yard, is building the Standard II, a 35-foot-long, 11-foot-beam, 7-foot-deck fishing vessel. The Standard II is a 165-horsepower diesel engine, and will be built in the yard where the Standard II is being built.

The Aleksandra I is one of the latest boats built at the yard. It is 35 feet long, and will have a 165-horsepower diesel engine. Captain George Stanovich is having built at the same yard an 80-footer which will have a 710-horsepower diesel engine.

The Harbor Boat Building Company, located at the yard, is building the Standard II, a 35-foot-long, 11-foot-beam, 7-foot-deck fishing vessel.

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A Pacific Marine Review representative recently visiting this yard noted a feature of handling the fishing vessels which has been developed by Mr. Rados. This is a solidly built platform set on roller bearings, permitting it to be easily swung so that the seine can flow out easily over a carrier roller or be hauled in over it. And the special feature is that the whole business can be lifted off and a dock boat can put in its place when



A part of the Southern California fishing fleet in harbor at San Pedro.

it is desired to change from purse seining to deep sea line fishing. Another feature of the Costa Rica II is a large bilge pump, hand operated to comply with regulations, but which is fitted with an under-deck discharge, thus preventing any contamination of a deck load of fresh fish by the oil from bilges. Bronze deck plates for icing and loading are also a part of the fittings and are fine pieces of work. The crew's quarters have also been made very comfortable, accommodations for ten men being provided above decks. As Mr. Rados said, these men pass most of their time on the boat and should have decent living places. Ventilation has been well worked out, while protection from heavy weather is in every way admirable.

The Los Angeles Shipbuilding & Drydock Corporation, while fitted to build the largest steel vessels, is also doing considerable business in the workboat line. They are just now engaged in building Hull No. 4, which is to be a purse seiner of their standard design. This craft is of wooden construction, 76 feet length, 20 feet beam, and 8 feet 6 inches depth. They are of the raised deck type, and will be engined with 150-horsepower diesel engines. Fuel and water tankage for a cruising radius of some 3000 miles is provided. The cost of these craft will approximate \$25,000. Capt. V. Karmelich, of San Pedro, is having one built which will be delivered in February. Two more are in prospect.

Besides workboats this yard has turned attention to hydroplane construction and will soon have ready for service two speedy craft. One is a 35-footer, fitted with a Liberty motor of 450-horsepower, and will make 35 miles per hour. The other is a 45-footer, which will have two Liberty motors of 450 horsepower each, and will make around 45 miles per hour.

Ets-Hokin & Galvan of Wilmington, a branch of the San Francisco house, reports a good run of business in their line of electric installations and general ship chandlery. The branch has made a great many outfits with small independent generators and storage batteries for fishing craft and workboats, and, with considerable repair work, reports business good.

Marine Engineering and Supply Co., Wilmington, of which Paul Hiller is manager, is entering the field

with good prospects of future business. Its location is admirable and extensive stocks will be carried so that delays in delivery will be avoided, something that the buyer will appreciate. The firm will make a special line of the Kroschell Refrigerating Machine, a unit which

has a reputation for good service and efficiency. The products of the Western Cordage Company will also be stocked. Extensive additions to the mills at Orange, California, will soon enable the manufacturers to turn out all classes of high grade rope.

Puget Sound Notes

Star Machinery Company, of Seattle, agents for the **Union Gas Engine Company**, of Oakland, report good business in the several lines they carry, with prospects of selling several marine diesel engines in the near future. Stocks and parts have moved fairly briskly, with recent inquiries for power plants for several boats.

Hall-Scott Motor Co. is represented in Seattle by **Walter Stark**, at 902 Western Avenue. This gentleman says that business is good in the line he handles, having sold some 24 units during the past season. A display of four types of these machines is on the floor of the warehouses, with a splendid stock of spares and supplies.

Among the boats powered by Hall-Scott engines is the Winifred II, owned by G. W. Skinner. She has just completed an Alaskan cruise of 6000 miles and did not have a moment's delay through engine trouble, her two 175-horsepower motors running smoothly and economically throughout the voyage.

Another enthusiast on Hall-Scott engines is P. J. McCue, head of the Northwest Fisheries, whose 60-foot boat Katherine is powered by a 100-horsepower unit. Though not a fast craft, the Katherine can do her 9 knots steadily. During Mr. McCue's survey of his company's fishing interests in Alaska the Katherine covered over 5,000 miles all going smoothly and well with the power plant.

The Pacific Marine Supply Co. of Seattle, northwest distributor for the Western-Enterprise diesel engine, reports fair sales of these units, as well as a very healthy outlook for future business. Besides the Western-Enterprise diesel, the firm carries the Palmer, Redwing, Universal, Frisby, and Standard gas engines, all of which have features of special advantage. Users sometimes prefer different types and styles, and the Pacific Marine Supply Company certainly carries a

big variety of engines and claims that all of them are of the highest rank in their line.

Besides engines, the firm stocks parts, supplies, and gear for workboats, as well as every conceivable sort of tool and materials used around fisheries and shipyards.

Schertzer Bros., boat builders, on the north shore of Lake Union, Seattle, do quite an extensive business in small craft building. They built the Far West, a fish carrier which cruises off Cape Flattery to the halibut banks, bringing in the catch from the vessels which remain there for fishing. The Far West is 65 feet by 18 feet, fitted with a Fairbanks-Morse CO engine of 100 horsepower. She is said to be the speediest of her type yet built, making a sustained sea rating of 11½ knots. She was designed by Coolidge and Hanson of Seattle, and is most staunchly and strongly built, with excellent lines. Schertzer Bros. have in their shop two cruisers under construction, one of 26 and the other of 38 feet.

Olson & Sunde Marine Works, 4125 Burns Avenue, Seattle, on the shores of Lake Union, operate a fine little yard devoted mainly to the building and repairing of fishing vessels. Both the proprietors are practical men, Mr. Olson specializing in engineering. A very well equipped machine shop is kept busy, while an under-cover boat-building shed is of great advantage for winter work. Modern machines at this part of the yard help turn out work quickly, and a force of skilled men is employed steadily. A well-built ways of capacity to haul out a 110-foot vessel has been busy all season. One of the many craft built there is the Electra, a 72 by 17½-foot seiner, with a depth of 9 feet. She is propelled by a 135-horsepower Washington-Estep diesel engine, and makes 10 knots easily. Another job the yard has in hand is the construction of the Mahala for the Richard Froboese Company, for demonstrating the Bolinder engine.

Decking for Steel Carfloats

Johns-Manville Mastic Boat Decking a Successful Solution for Difficult Problems

MUCH of the railroad freight entering and leaving San Francisco is handled across the bay of San Francisco on carfloats. The wooden barges used for this purpose have never been satisfactory because uneven loading causes them to hog, or sag, and in this condition they require too much expenditure of power in towing. A year or two back the Atchison, Topeka, and Santa Fe Railway ordered from The Moore Dry Dock Company a special steel carfloat for this purpose. The success of this float is now resulting in the building of additional floats along the same general lines. Competitive bidding gave the second Santa Fe car float to the Union Plant of the Bethlehem Shipbuilding Corporation.

As will be noted from the midship section reproduced herewith, the float is built much like a steel seagoing freighter. Her 12-inch dead rise on 38-foot beam adds to her stiffness and makes for easy towing. She is 260 feet long over-all and is divided into 14 water-tight compartments by 13 water-tight bulkheads.

Three tracks are fitted on the deck, and directly under each of the six rails the hull is stiffened by a longitudinal truss running the full length.

One very interesting feature of these new barges is the Johns-Manville Mastic boat decking.

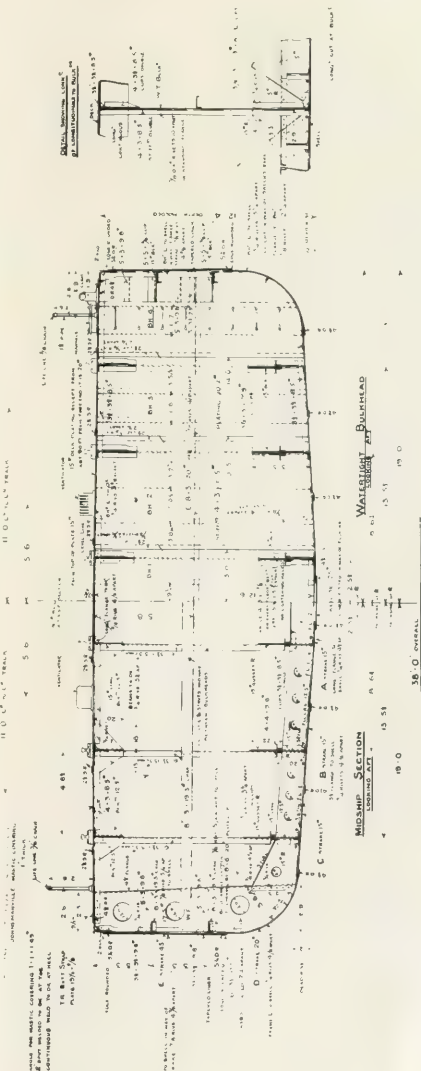
With the evolution of steel barges came the problem of successfully waterproofing the deck plates to prevent corrosion and scaling and further provide a durable nonslip wearing surface.

As a result of specifications developed by the Johns-Manville Corporation for railroad carfloats in New York Harbor, the most permanent and water-proof barge deck covering was found to consist of an asbestos felt membrane overlaid with 1 1/4 inches of Mastic boat decking. The water-proof membrane between the decking and the steel plates prevents natural expansion and contraction movements of the steel from seriously affecting the mastic decking.

Barges of this type are constantly subjected to heavy loads and rough treatment which result in unusual strains over the entire structure. Not only does the Johns-Manville Mastic boat decking absorb the strains and shock, but it provides a durable wearing surface and one which can be easily and cheaply repaired in case of accident.

This type of decking was found so satisfactory for the New York Harbor carfloat service that the same specification was adopted by the Santa Fe for their first steel carfloat built for them on the Pacific Coast by The Moore Dry Dock Company.

The entire deck of the carfloat now being built for the Santa Fe by the Bethlehem Shipbuilding Corporation is protected by Johns-Manville Mastic boat decking applied by the manufacturers. The inside surfaces of this carfloat also have been water-proofed with Johns-Manville Bituminous enamel. This protects the metal against the effects of bilge water. Johns-Manville Bituminous enamel is a material which has been widely used by the United States Navy for protection of hulls and steel work.



Westinghouse Electric Developments in the Marine Field During 1927

THE Westinghouse Electric and Manufacturing Company has recently completed its annual report of the economic achievement of its operations in 1927. From this document we select the following items of interest to the marine field. Following marine use, the air, railway, and street lighting fields are the most important ones in which the Westinghouse Corporation has shown activity that must be mentioned.

Transportation Marine Air

From 1926 through 1927, the Westinghouse Electric and Manufacturing Company has completed 10,000 horsepower of marine engines, the production of which is a record. The company has also completed 10,000 horsepower of marine engines, the production of which is a record. The company has also completed 10,000 horsepower of marine engines, the production of which is a record.

During the year, the new building under the Washington Conference limitation. Such great results have been the result of the company's efforts to improve its products and services. The company has also completed 10,000 horsepower of marine engines, the production of which is a record. The company has also completed 10,000 horsepower of marine engines, the production of which is a record.

For quality, not cheapness; but electric drive for merchant vessels must prove actual economies before critical judges in actual service, where the ultimate dollar is the object. In the case of the freighter, where maneuvering ability is essential, the electric drive has been found to be the better. Steel Electrician—which are handled direct from the pilot-house—later in deep sea freighters converted to diesel-drive, where the considerations are the compact, convenient layout, the avoidance of need for an auxiliary electric plant,

greater economy in fuel, and the absence of the need for a large crew of men to operate the engine. The electric drive has been found to be the better.

There is no doubt that the electric drive has been found to be the better. The electric drive has been found to be the better. The electric drive has been found to be the better. The electric drive has been found to be the better. The electric drive has been found to be the better.

Electric Drive Installations

During the year, the Westinghouse Electric and Manufacturing Company has completed 10,000 horsepower of marine engines, the production of which is a record. The company has also completed 10,000 horsepower of marine engines, the production of which is a record.

This year San Francisco Bay has seen many new electric drive double-end ferries; among them:—

Key System, two turbo-electric, each of 2100 kilowatts total generating capacity;

Southern Pacific, six diesel-electric, each of 1260 kilowatts total generating capacity;

Golden Gate, three diesel-electric, each of 930 kilowatts total generating capacity.

Equipment for a big diesel electric tanker was built this year, 3200 horsepower, ranking largest among diesel-electric until surpassed by the Shipping Board boats. There are four generating units, totalling 3100 kilowatts. There are a great many motor driven pumps ranging from 1 horsepower to 200 horsepower. The vessel will have electric automatic steering, simple, rapid, accu-

rate, built by the Sperry and Westinghouse companies in conjunction. The owner is the Standard Oil Company of California.

Four new Coast Guard cutter, 3000 horsepower each, built by the Westinghouse Electric and Manufacturing Company, are now in operation. On each boat, a single turbine-set supplies power to a single propulsion motor. In addition, each boat has two 1000 horsepower motor sets for auxiliary power. The Westinghouse Electric and Manufacturing Company has also completed 10,000 horsepower of marine engines, the production of which is a record.

Micarta

During the year the first airplane flight to Hawaii was made with three micarta propellers (Maitland-Hegenberger). The second successful contestant in the Dole flights to Hawaii (Jensen) used a micarta propeller. The flight planned to Australia, which was scheduled for December, will be with three micarta propellers. The Secretary of War flies with micarta propellers on his official plane, used in government traveling.

Westinghouse Electric and Manufacturing Company, South Philadelphia Works, has recently released an interesting and instructive leaflet entitled **Direct Connected Turbine Generator Units—Capacities 5, 7½, 10, and 15 kilowatts**. These units are for 125 and 250 volts direct current operation. The number of the new leaflet is 2000-D. Included in the leaflet are a number of photographs showing the construction and operation of these units.

These leaflets may be obtained at any of the district offices of the Westinghouse company or at the Advertising Department at East Pittsburgh, Pa.

Rain Damage Minimized

RAINFALL has to be guarded against while loading freight which might be damaged by water. To prevent such damage the heads of the Luckenbach lines, San Francisco, and H. Brann, of the Haviside Company, joined forces to bring out something which would insure protection from rainfall, no matter how heavy.

The regulation rain tent, manufactured by the Haviside Company, has been supplemented by canvas coverings which are placed over every sling load of freight before it leaves the wharf sheds on its way to the ship's hold. This is made of No. 4 waterproof material, about 6 by 8 feet, with a flap border which naturally falls around the slingload as it is lifted. Thus protected the load



Haviside hatch tents, as arranged in place aboard a freighter.

goes to the hold, and the cover is sent back with the empty slings to repeat its work.

It has been found that a dozen or so will serve for usual work at a hatch. Eighty were recently made to the Luckenbach Steamship Company's order. Convenient grommets are worked into the covers to

facilitate handling and their employment does not appear to delay lading of cargo. They insure dryness, and it is believed that the new plan is about as near perfect as can be evolved for practical use. The illustration herewith shows how the tents are arranged during wet weather.

A New Fog Lamp

FOG, one of the greatest hazards to aviation and navigation, may lose some of its dangers in the near future as the result of the development of a new type of quartz neon gas-filled lamp by research engineers of the General Electric Company. This lamp, which resembles a ball of reddish orange fire when in use, emits practically all its visible radiation in the long wave lengths, which tests have shown to have greater fog penetrating power than light higher in the spectrum.

It was found that during a heavy morning mist, when the laboratory building in which the new lamp was housed could not be seen 500 feet away, the brilliant red glow penetrated to a distance of half a mile or more. In discussing the possibilities of neon light for aviation purposes, C. G. Found, who developed the new lamp, said:

"We don't know yet how far this red light can be seen. However, a neon lamp of earlier type with but half the candlepower was reported seen by an aviator on a clear night at a distance of 75 miles. We are

going to place this new light and one of the standard white light airport beacons on the roof of one of our tall factory buildings in Schenectady. In this way we hope to learn from direct visual tests just how much of an advantage the neon light has in bad weather. We think that, because of the contrast in color, the red light will be helpful to aviators in more easily picking up guiding beacons and landing fields at a distance."

Quartz is used in the lamp because of the heat generated in its operation. The temperature is about 1200 degrees Fahrenheit, which is above the fusion point of glass. Quartz, however, will stand temperatures up to 2000 degrees Fahrenheit before beginning to soften.

Another feature of the new lamp is its operation on low voltage, substantially that used in household service. Previous types of neon lamps required very high voltages, often as much as 15,000 volts, to enable them to produce sufficient candlepower to make them useful. Such voltages are not only danger-

ous unless carefully guarded, but they require special equipment to produce them.

According to Mr. Found, the use of low voltage is made possible by a hot cathode within the tube, which provides sufficient electron emission to supply the current for the luminous discharge, and also results in increased length of life in the lamp. "We have found in tests," he said, "that there is less tendency for the neon gas to disappear and blacken the lamp when low voltages are used. One of these hot cathode lamps has now operated for 3000 hours and has showed no signs of deterioration."

The beacon lamp consists of a small quartz tube wound in a close spiral $1\frac{1}{2}$ inches in diameter. This is done for the purpose of obtaining as nearly as possible a concentrated spot of high brilliancy which can be placed at the focal point of the usual type of searchlight reflector. By this means a narrow concentrated beam of colored light can be made to reach much further than the light from a larger tube.

Electrical Developments in the Marine Field During 1927

By D. W. Niven, Manager, Electrical and Marine
Department, General Electric Company

SINCE the first commercial application of the electric propulsion system in 1839, when the *Plunger*, first built by the Parsons Electric Light and Power Company, has been in constant operation, there has been a constant growth in the industry and use of electrically-propelled craft.

At the close of the last 1926 there had been built in this country more than 1,000 electrically-propelled boats, of 138,000 horsepower, producing nearly 100,000 shaft horsepower, making them, from a horsepower and weight standpoint, the largest type in the world. The development of these boats is expected soon to reach the point where they will be able to produce power in excess of 100,000 shaft horsepower, and to be used for all types of marine propulsion.

The General Electric propelling equipment consists of a motor, or motor set, and a generator, or generator set, mounted on the main engine shaft, and connected to the propeller shaft by means of a coupling. The motor set is connected to the main engine shaft by means of a coupling, and the generator set is connected to the main engine shaft by means of a coupling.

Turbine-Electric

The outstanding event of the year was the commissioning and installation of the turbine-electric propelling equipment for the *Pacific liner California*, the largest passenger ship ever built in the United States and the largest electrically-driven ship of her class in the world. The *California* is a battleship ship with a displacement of 30,250 tons at load draft. The maximum energy delivered to her propeller shaft is 17,000 shaft horsepower, and a speed of 18.4 knots can be attained with this power input. At the cruising speed of 16.5 knots, the output of the turbine-generator is 13,500 shaft horsepower, and at this speed the ship has a cruising radius of 15,400 miles.

The propelling equipment comprises two 16-stage, steam turbine generators, each having a maximum capacity of 6600 kilowatts, at 2880 revolutions per minute. This power is transmitted to the propeller shafts by means of two synchronous induction type motors having a continuous maximum rating of 8500 shaft horsepower at 120 revolutions per minute. These motors are direct-connected to the propeller

shafts and are connected to the main engine shafts by means of a coupling. The motor set is connected to the main engine shaft by means of a coupling, and the generator set is connected to the main engine shaft by means of a coupling.

The generator set is connected to the main engine shaft by means of a coupling, and the motor set is connected to the main engine shaft by means of a coupling.

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The electrical auxiliaries for use when under way are driven from the main unit directly or from a motor generator set which operates from the main unit, while the electric equipment for unloading cargo in port is driven directly from the main unit. When under way, a variation in the revolutions per minute of the propeller is accomplished by varying the speed of the turbine. In port, the main turbine is run at constant speed and, in case maneuvering is required simultaneously with the unloading operation, variation in the propeller speed is accomplished by means of resistance inserted in the secondary circuit of the propelling motor.

Diesel-Electric

Early in the year the new diesel-electric coastguard cutter *Northland* was launched and went into service, and is now serving on patrol in the Alaskan waters as the successor of the famous patrol cutter *Bear*, which was built in 1874.

The main engine room equipment consists of the diesel engine, or engine generator, which makes 410 revolutions per minute at the maximum speed. These engines are of the direct-coupled type, and are connected to the propeller shaft by means of a coupling. The motor set is connected to the main engine shaft by means of a coupling, and the generator set is connected to the main engine shaft by means of a coupling.

The motor set is connected to the main engine shaft by means of a coupling, and the generator set is connected to the main engine shaft by means of a coupling.

The main power plant in each of these boats consists of two 100-horsepower diesel engines, each of which is connected to the propeller shaft by means of a coupling. The motor set is connected to the main engine shaft by means of a coupling, and the generator set is connected to the main engine shaft by means of a coupling.

Equipment was under construction for an electrically-propelled packet boat designed to carry 250 tons of package freight at a speed of 12 miles an hour between New Brunswick, New Jersey, and points in and adjacent to the harbor of New York.

In this case, electric propulsion was selected primarily because the height of the engines could be kept down and thus allow a clear deck for package freight and on account of the ease with which this packet boat could be controlled in maneuvering in congested waterways.

The power plant will consist of two 250-horsepower, 300-revolutions-per-minute diesel engines driving direct-connected main and auxiliary generators. The single propeller will operate at speeds up to 175 revolutions per minute, and the driving motor will develop 400 shaft horsepower.

Another novel application of diesel-electric drive was inaugurated by the Bureau of Lighthouses of the United States Department of Commerce by its decision to adopt this method of propulsion for three new lightships. The equipment for each

ship will consist of four 75-kilowatt main generators and two 7½-kilowatt separately-driven auxiliary generators, the single propelling motor for each ship being rated 350 shaft horse power at 300 revolutions per minute.

In this case, the propelling equipment will be utilized intermittently as the lightships, when in service, are at anchor most of the time. In severe weather, the propulsion equipment will be used to take the strain off the anchor chains and will, of course, be utilized for maintaining position in the event of the breaking of the moorings.

Auxiliaries

The new single-gear type of motor-operated deck winch, in which the driving motor is designed so that a minimum accelerating torque is required on average loads, was installed on the new International Mercantile Marine liner. This is the first extensive application of these winches, and is the result of their ability to give high tonnage

rates with low power consumption.

The new 10,000 ton light cruisers for the United States Navy impose severe limitations on the weight of both the main and auxiliary machinery in order to keep the tonnage of these ships within the limitations of the Washington Treaty and at the same time permit them to carry the desired armament.

Work on twenty-four 250-kilowatt 10,000-revolutions per minute, turbine-gear, direct-current generating sets is now under way, and the adoption of geared connection between the high speed turbine and the generator has effected a marked reduction in weight as compared with standard equipment. These sets are for the operation of motor-driven auxiliaries on the cruisers.

The use of electricity on shipboard has grown tremendously in a relatively few years, and the General Electric Company is proud to have been so prominently associated with the major developments of such apparatus.

way of each tank opening (ullage hole). The machines are installed in the ullage holes and are connected to the 1½-inch valve. A water pressure of 100 pounds is applied to the machines, which are operated by air motor located at the upper end. At the lower end of the machine, which extends down into the tank 18 feet, are located two 5/8-inch nozzles. The motor located at the upper end turns these nozzles slowly in a horizontal plane and a perpendicular plane. No water is allowed to accumulate in the bottom of the tank while cleaning, this being stripped off immediately and returned to the supply tank or pumped into a slop line or overboard. The reason for keeping the bottoms stripped is in order to take advantage of a continuous flushing effect which is one of the most important features in the cleaning operations, due to the fact that the tank bottoms are the most important parts to clean. It must be remembered that the machines do not spray, but direct two slow moving nozzle streams against the sides, top and bottom of the tank. The flushing is kept up for four or five hours in each tank as the case may be. Pipe lines, valves and fittings are thoroughly flushed out with this system.

The liability feature of sending men into the tank to clean, scrape and wash and the unsatisfactory results obtained both with the crew and shore labor, make this better method welcome to tanker operators.

There is no doubt but that the time is not far off when very stringent rules and regulations will be applied by government, state, and local officials or underwriters demanding thorough and absolute cleaning of tankers before entry into the shipyard or before repairs are undertaken.

A number of vessels have been cleaned by the "Butterworth Process" with very satisfactory results.

The steamship Wm. Isom, Cuban Distilling Company, from heavy Mexican to refined oil cargo, en route from Baltimore to Houston.

Barge Dallas, the Texas Company, road asphalt removed from tanks in order to test tanks, at Port Arthur, Texas.

Motorship Pennant, the Pure Oil Company, from heavy Mexican to refined oil cargo, at Smith's Bluff, Nederland, Texas.

New Method of Cleaning Oil Tanks

OF special interest to tanker operators and underwriters are the recent tests of gas freeing tankers by the "Butterworth System." Although this is the most radical change in the past twenty-five years for accomplishing this work, most satisfactory results were obtained.

The Texas Company tankers Virginia and Pennsylvania are sister ships of 6666 gross tons. Previous to regular docking period the ships were to be gas free. The conditions to be met with were very severe inasmuch as both these vessels have been constantly in the heavy Mexican trade between Tampico and United States ports. The residue from this oil, which is asphalt base, is very hard to remove, and the results obtained with these vessels lead us to believe that vessels in the Gulf or California crude trade would respond readily to this system.

The tests were under the personal supervision of Arthur B. Butterworth, the inventor of the process and machine, assisted by Thomas Cornick of the Texas Company, Marine Department, New York. No outside labor was used, the crew alone doing the manual labor. A very important feature of this system, and one in which the operators and underwriters will agree, is the fact that steaming of tanks is en-

tirely eliminated. This has been known for many years as a very undesirable procedure, especially to the structural parts of the hull, without the effect of accomplishing satisfactory results. Steaming has been tolerated due to the fact that no better process was available.

Most of the cleaning on the steamer Virginia was done while the vessel was en route from Providence, Rhode Island, to New York. Several different features were tried out on this vessel, and were of great assistance in accomplishing better results on the steamship Pennsylvania. During the time the vessels were being pumped out, the cleaning gear was fitted up and the cleaning water heated. Shortly after discharging, the cleaning gear was put in operation, four tanks being cleaned at one time. No one entered the tanks at any time for the purpose of cleaning, all cleaning operations being accomplished by the cleaning machines.

In the cleaning operations sea water is stored in one of the cargo tanks in which heater coils are located, this water is heated as hot as possible (in this case a temperature of 160 deg. Fahrenheit was maintained). One of the cargo pumps draws the hot water from storage, delivering it into a 2½-inch (temporary) pipe line on deck. A 1½-inch valve outlet is fitted in the

Trade Literature

The Commerce Yearbook for 1927 (Vol. 1). Published by the United States Department of Commerce. (Price \$1.)

Volume 1 of the Commerce Yearbook for 1927 contains the statistics and general information of the yearbook, including the general statistics of the United States for 1927. The book is divided into two parts: the first part contains the general statistics of the United States for 1927, and the second part contains the general statistics of the United States for 1927. The book is a valuable reference work for the study of the commerce of the United States.

Worthington Pump and Machinery Corporation has issued an interesting brochure, "High Efficiency Ball Bearing Centrifugal Pumps for General Service," which gives some interesting data on construction, factors of efficiency and costs, and description of parts and manufacture.

Markey Machinery Company, Inc., Seattle, Washington, has issued an interesting and well-illustrated catalog on "Viking Oil Engines—Marine and Stationary."

This catalog contains a complete list of all the engines, pumps, and other machinery suitable for fishing boats, tug boats, and cruisers and yachts requiring economical and sturdy marine engines. A complete description of the engine, horsepower ratings, features of starting, lubrication, fuel injection, flexibility, economy, etc., is contained in this bulletin, together with a catalogued section of all parts, completely illustrated. Several workboats, yachts, and cruisers powered with the Viking engines are used as illustrations.

Port of Manila—Trade Center of the Pacific—is the title of the 1927 yearbook issued by the Manila Harbor Board, Philippine Islands. This is a well illustrated, nicely printed volume containing statistics and general information covering: Port facilities, port economics, and port efficiency; Manila and the Philippine Islands, a delight to the traveler; government public works and improvements, illustrated types

of public works; foreign shipping and trade; Philippine economy; and the Philippine Islands in world trade.

The book should be of interest to all foreign traders and shipping companies interested in trade with the Philippine Islands. The Manila Harbor Board will gladly send a copy to anyone.

Los Angeles Harbor Annual Report, 1926, has been issued by the Harbor Board. It contains a complete description of the harbor, its facilities, and its commerce. It is a valuable reference work for the study of the harbor of Los Angeles.

The book is divided into two parts: the first part contains the general statistics of the harbor, and the second part contains the general statistics of the harbor. The book is a valuable reference work for the study of the harbor of Los Angeles.

Centrifugal Pumps and their Accessories is a book published by the De Laval Steam Turbine Co., Trenton, New Jersey. It contains a complete list of all the pumps and accessories suitable for the marine and stationary service.

The book is divided into two parts: the first part contains the general statistics of the pumps, and the second part contains the general statistics of the pumps. The book is a valuable reference work for the study of the pumps and their accessories.

Alloy Cast Iron Meets High Duty Requirements is the title of a four-page paper issued by the International Nickel Co. A practical, non-technical description of the improved physical properties secured by the addition of Grade "F" nickel to gray cast iron, with a tabulation of the physical and mechanical characteristics of the alloy iron as determined by physical laboratory in-

vestigations and tests conducted in the field.

741 International Nickel Company, Inc. has issued a book, "Notes on Machining Alloy Steel." It contains a complete list of all the alloy steels and their properties, and a complete list of all the alloy steels and their properties. The book is a valuable reference work for the study of the alloy steels and their properties.

Instructions for Adding Nickel to Cast Iron. A chart illustrating the approved foundry practice for adding nickel and chromium in the ladle or cupola spout with a handy reference showing the types of castings for which alloy additions are recommended and are being successfully used. Printed on a substantial grade of cardboard. This chart may be obtained free of charge on request to the International Nickel Company, New York, or through this magazine.

An interesting pamphlet for marine engineers and boat owners, issued by **Shonberg Inc.**, Brooklyn, N.Y., on **White Metals and Babbitt**, their origin, history, and progress, and the various alloys of such anti-friction metals. It contains a number of pages of information and data of particular interest to the seagoing engineer. It will be sent to any marine engineer on request.

Shonberg Inc. has been producing anti-friction metal for the exacting requirements of the marine trade since 1875, and has recently installed special automatic machinery for producing fusible plugs and condenser ferrules.

New Cutler-Hammer Office

Beginning January 1, 1928, the Pacific Coast representative, **The Cutler-Hammer Mfg. Co.**, Milwaukee, Wisconsin, manufacturer of electric motor control apparatus and allied lines, is handled by its own Pacific Coast sales offices, at 979 Folsom Street, San Francisco; 229 Boyd Street, Los Angeles; 2203 First Avenue, South, Seattle.

Marine Insurance

Edited by JAMES A. QUINBY

A New Year---Why Not a New Bill of Lading?

THE average ocean bill of lading now in use is about the most verbose, antiquated, cumbersome, and inequitable instrument that has ever been foisted on humanity in the guise of a commercial document. Our ocean commerce exists in spite of, rather than by reason of its provisions. It is a joke to those who understand it and the despair of those who do not. Why shouldn't we change it?

Agnes ago, we are told, there was no bill of lading. A ship owner was liable for anything that happened to goods entrusted to his care, save only the act of God, inherent vice, and act of the public enemy. But it was soon realized that shipowners must be encouraged, especially in England. Such a harsh doctrine of liability promised to do away with the ship-owning fraternity altogether by a process of financial extinction. So public policy, which had kept jealous watch over the early carrier, was pushed more and more into the background as Britannia rose to the supremacy of the seas, until, by the middle of the last century, the so-called "freedom of contract" theory was adopted. This theory fatuously assumed the shipowner and shipper to be contracting on an equal footing, and allowed the former to impose his own terms, on the specious ground that if the shipper didn't like it, he didn't have to sign. The only trouble with this is that the shipper faces the same terms imposed by other carriers, and finds that he must accept them or not ship at all. In short, the parties do not contract on equal terms, and the cargo interest should be protected.

Decisions in the American courts expressly denied this freedom of contract theory, with the result that American ship owners were subject to more onerous liabilities than their British competitors. As a compromise measure to remedy this situation, the Harter Act was passed, allowing the vessel owner, under certain conditions, to exempt himself for damage resulting from errors in navigation or management of the ship, but forbidding any exemption where the damage was due to faulty care of the cargo.

ELEPHANTASY

It seems to me

The ships I know are great, obedient beasts
That wander to and from, scarce knowing,
As they rub their dripping sides, the passing whimsy
Of the man who rides, a mahout on a forehead broad.
About their heaving flanks the winds of far adventure
blow—

And coral banks and snow-topped ranges half unseen,
Fence in their many-fathomed pastures green.

They dream with patient eyes of storms and far-flung
island ports,

While small men tug upon their chains and lead them
into courts.

J. A. Q.

Harter Act Basically Sound

In practice, the Harter Act has proved itself a satisfactory compromise measure. In spite of numerous attempts to evade its provisions by cleverly worded clauses in bills of lading, our courts have steadfastly refused to allow a carrier to contract directly against liability for his negligence in the handling of cargo.

Although direct evasion of the shipowner's liability has been discouraged, the carrier has been very successful in hiding behind certain indirect provisions which make it very difficult to prove a case against him.

Immediately after the act was passed, carriers began to introduce clauses in their contract of affreightment providing that they were not to be liable for certain enumerated damages, such as breakage, sweat, contamination, and like, "however caused." As an effort to avoid liability for negligent care and custody of cargo, these clauses are void under the Harter Act, and have repeatedly been held worthless. If this is so, you ask, why does the modern bill of lading contain clauses purporting to exempt the carrier from liability for every known form of damage? Simply because the courts have held that while these clauses are ineffective to evade the shipowner's duty properly to care for his cargo, they nevertheless have the highly important virtue of shifting the burden of proof.

Take the breakage exception, for example. A cargo of furniture arrives in a smashed and splintered condition. The shipowner folds his hands and blandly points to a clause in his bill of lading proclaiming to all and sundry who have the patience to find it and a microscope to read it, that the ship is not liable for breakage. If the breakage in question is negligent, the clause is void and the ship liable. If the breakage was not caused by negligence the clause does not contravene the Harter Act. In this dilemma, our courts have held that it is up to the cargo owner to show that the damage was due to the negligence of the ship.

Arthur M. Brown

EDWARD BROWN & SONS

Arthur M. Brown, Jr.

MARINE DEPARTMENT—Harry W. Browne, Manager

PACIFIC COAST GENERAL AGENTS

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FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

The Burden of Proof

Insurance is a business, and as such it is the nature of the business that the carrier, who is the insurer, is liable for the loss of the cargo, unless he can prove that the loss was caused by some other cause. This is the burden of proof, and it is the carrier's duty to prove that the loss was caused by some other cause. The carrier's duty is to prove that the loss was caused by some other cause, and it is the carrier's duty to prove that the loss was caused by some other cause. The carrier's duty is to prove that the loss was caused by some other cause, and it is the carrier's duty to prove that the loss was caused by some other cause.

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Time Clause the Worst Ambush

Of all the pitfalls that threaten the unwary footsteps of the ocean shipper the time clause is by far the worst. There are various clauses, as many as there are bills of lading, requiring notice of claim to be filed in forty-eight hours, or three days, or ten days, from the time the goods are discharged. Other clauses require suit to be filed on claims within thirty days, or sixty days, or ninety days.

These clauses are seldom complied with. To the credit of many carriers be it said that the time requirements are often waived. There is something undigni-

fied in the requirement of an indemnified shipper to come back and sue the carrier, and the carrier's duty is to prove that the loss was caused by some other cause.

Of course, there is a time clause in every bill of lading, and it is the carrier's duty to prove that the loss was caused by some other cause. The carrier's duty is to prove that the loss was caused by some other cause, and it is the carrier's duty to prove that the loss was caused by some other cause.

The carrier's duty is to prove that the loss was caused by some other cause, and it is the carrier's duty to prove that the loss was caused by some other cause. The carrier's duty is to prove that the loss was caused by some other cause, and it is the carrier's duty to prove that the loss was caused by some other cause.

A standard ocean bill of lading, drawn up in accord with the Hague Rules, would be a boon to ocean commerce. There are certain objections to it, to be sure, but we seldom hit the bullseye at the first shot. The Federal Longshoreman's Compensation Act is not perfect, but it's several times better than the battle royal between state laws which formerly obtained.

If the Hague Rules tread on some of our pet concepts of general average or seem to conflict at certain points with the Harter Act, why not frame a compromise bill of lading? Anything would be better than the chaos which now exists. Congress at its last session threatened to give us a standard contract—here's hoping the deal goes through this trip.

We should have a year—perhaps a half a year—

Reverse English on Benefit of Insurance

FROM time immemorial, shipowners have endeavored to obtain the benefit of cargo insurance. They have contended strenuously for the right to say to the cargo owner, "Yes, we damaged your goods, but you have already been indemnified by your insurer, consequently we owe you nothing."

The present state of the law, however, prevents this, and protects the right of subrogation in the cargo underwriter, provided always that the latter is bright enough to pay his loss under a loan receipt. See *Luckenbach v. McGahan*, 248 U.S. 139, and the *Turret Crown*, 1924 A. M. C. 253.

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

It is refreshing indeed to find a case where the shoe is on the other foot.

In the case of the Santa Cristina, 1927 A.M.C. 1811, the vessel owner, not knowing just what bills of lading would be issued at foreign ports of loading, and in order to cover its own risk in case these bills of lading failed to contain the usual clause making the freight due upon delivery of the goods to the carrier, took out a policy to cover its risk on "unpaid and/or collect freight."

The cargo owner also insured his goods for an amount large enough to include the freight, and the Santa Cristina sailed merrily forth, only to become a total loss on the voyage. The cargo owner, acting no doubt in accord with the wishes of his insurer, refused to pay the freight and claimed to be protected by the shipowner's policy on "unpaid and/or collect freight." It will be seen that this is the exact converse of the contention raised in the earlier cases where the vessel-owner tries to gain the benefit of cargo insurance.

The cargo owner did not dispute his liability to pay the freight under the bill of lading, but rested his claim solely on his right to the benefit of the freight insurance.

The District Court in New York held that the cargo owner had no right to the benefit of the freight insurance, but must pay the freight in full. The following comment appears in the opinion:

"It is quite apparent from the terms of these riders, if not from the policies themselves"—(meaning the freight policies)—"that identification of the assured is left to be determined by agreement, in this case expressed in the terms of the certificates. Each certificate shows that the insurance under the open policy was placed for 'New Orleans and South American Steamship Company and/or agents.' There was no relation of agency between the steamship company, the libellant, and the shipper, the respondent. The contract as written plainly did not insure the shipper against any loss, and only covered the owner's risk of loss which might arise from inability to collect 'unpaid and/or collect freight' arising from perils insured against. Although such insurance is obviously unnecessary in the case of freights payable, as these were, upon receipt of the goods, 'without deduction, (if unpaid) or refund in whole or in part (if paid), goods or vessel lost or not lost,' this circumstance cannot give rise to a contract different from that which was written, and which in terms precludes the claim that it was written for the benefit of shippers of cargo."

IF WE WROTE WHAT WE THOUGHT

Mr. Epsom Salz.

Box 111.

Grasshopper, Cal.

Dear Sir:

In order to get you out of the office yesterday, we promised to write you our attitude on your application for a position with our firm.

We have several positions open which we would gladly see filled by a person of your approximate weight and height, just so long as it isn't you. We didn't like your hat nor your tie nor the way you came in nor the way you went out.

Yours very very truly,
Consolidated Wimpus Co.

Mr. Melvyn Smythe.
Ratz Apartments.

Dear Sir:

We have just bought up a bum claim against you in the amount of \$500. We feel sure that you are more afraid of a lawsuit than we are, since you have a reputation. If we can shake you down for about a hundred dollars we'll be happy.

Come and see us sometime.

Hittem and Duk, Attorneys-at-Law.

Dessicated Crowbars, Inc.,
Sodawater, Cal.
Gentlemen:

We have your letter of the 32nd inst. filing claim under our policy No. 666. Of course, we're not going to pay the claim. We never made any money off your old account anyway, and besides, you cancelled your open policy with us, so we won't get anything out of you in the future. We already spent your premium for Christmas presents, and we've got our fingers crossed.

Just look at your policy and see how many perfectly lovely defenses we have to your claim. Of course, we haven't read them all, but they must be in there somewhere. Now aren't you ashamed of yourself for sending us a claim? We'll overlook it this time.

Jesse James Mutual Insurance Company.

George J. Anklebrace,
Patootie Terrace.

Dear Sir:

We know our S.S. "Australian Sinker" damaged your shipment of dill pickles, but we're writing this letter in the hope that you'll think we are investigating the matter, and so delay further action until the time clauses in our bill of lading have run. Then we'll write you another letter advising you to see your underwriter about it.

Balfour, Kessler Agencies Inc.

Marine Insurance Department

Agents for

AMERICAN AND FOREIGN
NORTH CHINA

UNION OF CANTON
QUEENSLAND YANG TZE

BRITISH AND FOREIGN
PENNSYLVANIA

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SAN FRANCISCO
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LOS ANGELES

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THAMES & MERSEY

Marine Insurance Co., Ltd.

LIVERPOOL & LONDON & GLOBE

Insurance Co., Ltd.
(Marine Department)

HARTFORD

Fire Insurance Co., Ltd.
(Marine Department)

CANTON

Insurance Office, Ltd.

LOUIS ROSENTHAL

General Agent

302 California Street

Phoenix Assurance Co., Ltd.

Union Marine Ins. Co., Ltd.

Norwich Union Fire Ins. Society,
Ltd.

British & Federal Fire Underwriters

PACIFIC COAST BRANCH

(Marine Department)

114 SANSOME STREET

Phone Douglas 6311

MARINE DEPARTMENT

J. B. F. Davis & Son

Standard Marine Insurance Co.
National Union Fire Ins. Co.
Mercantile Insurance Co.
of America

240 SANSOME STREET
SAN FRANCISCO CALIFORNIA

Marsh & McLennan

INSURANCE BROKERS

AND

AVERAGE ADJUSTERS

SAN FRANCISCO

SEATTLE LOS ANGELES

ROY C. WARD

GEO. B. DINSMORE

WILFRED PAGE

GEO. E. BILLINGS COMPANY

308-12 CALIFORNIA STREET, SAN FRANCISCO.

DOUGLAS 6400

INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

At this writing (Dec. 15, 1927) we've only read halfway through our bill of lading, but we find it more and more interesting as we go along.

Oh yes, about your claim. We never pay those small ones—it wouldn't pay you to sue on them.

Sincerely,

Interocean Steamship Co.

Late Again

THE Circuit Court of Appeals for the Fourth Circuit in reversing a decision of the District Court in Virginia has just held that a three month time to sue clause in an ocean bill of lading is valid, even though the vessel in question had been in the United States only one week during the three months.

It has consistently been held that a clause is enforceable which provides that suit against a vessel for cargo damage must be filed within three months after proper notice of claim. In fact, the famous "Turrer Crown" decision (275 Fed. 961) included a ruling on the point. But attendant circumstances have often been taken into account to lessen the severity of the rule.

In the present case (The Naples Maru, 1927, A.M.C. 1723), a foreign-owned vessel delivered goods short and damaged. Notice of claim was given, but the three month period specified in the bill of lading went by without suit being filed.

The libellants contended that as the vessel had been in the country for but seven days out of the period, they had in fact been unable to file an action in rem against her. They insisted that a strict application of time limitation under the clause in question would operate to deprive them of a remedy. In spite of this contention, the court, after giving a brief outline of the legal history of the clause, proceeds to rule as follows:

"It is also quite clear from the decisions that the clause in question should not be applied in any case unless it is reasonable to do so. Events subsequent to the issuance of the bill of lading may be considered, and amongst others, the accessibility of the ship to the process of the courts.

Thus it is said in the Queen of the Pacific, 180 U.S. 49, 53, that 'the reasonableness of the requirement is one largely dependent upon the object of the notice and the length of the voyage. Thus, a notice which would be perfectly reasonable as applied to steamers making daily trips, might be wholly unreasonable as applied to vessels engaged in a foreign trade. . . . Notice might also be deemed reasonable, or otherwise, according to the facts of the particular case. Thus, if the Queen of the Pacific had been driven out to sea and was not heard from for thirty days, obviously the provision would not apply, since its enforcement might wholly destroy the right of recovery. The question is whether under the circumstances of the particular case the requirement be a reasonable one or not.'

"After careful consideration of the facts, we do not think it unreasonable to give effect to the terms of the bill of lading in the case at bar. The evidence shows that the shipper was represented by agents not only in this country but also at Antwerp and Bordeaux; that a legal proceeding was actually instituted by the libellant against the ship in a court of justice in France; and that subsequently the ship for a period of a week was at the port of Philadelphia in the United States. There is no evidence in the record that the shipper was not well advised at all times as to the location of the ship, or that it was impossible or inconvenient to bring an earlier suit. We do not hold that the absence of a ship from the ports of this country is not a circumstance to be considered in determining the reasonableness of such a clause as that in question, but only that it is reasonable to apply it under the circumstances of the case at bar. The libel should have been dismissed, and the decree of the District Court must therefore be reversed."

There is no doubt that there should be some limit to the time within which a suit may be instituted against a carrier for damage

to cargo. In the absence of a limit, the libellant might delay for years, until such time as the ship's witnesses were impossible to locate. It is regrettable that a standard time to sue period cannot be adopted, similar to the limit in the standard rail bill of lading. Since the standard ocean bill of lading appears to be still in the Utopian stage, the only remedy for cargo owners and insurers is to check the bills of lading under which their goods move and either sue within the time allowed, or obtain from the shipowner a written extension of the period.

Of course the time to sue clause, like other clauses in the contract of affreightment, fails to protect a ship which has been guilty of deviation.

In *Blumenthal vs. United States*, 1927 A.M.C. 1726, this principle is reaffirmed, the court saying "deviation is deviation, and its effect, when it occurs, is the same; this effect is to abrogate the contract and give the shipper an action for conversion. . . . After deviation, the shipper has the option to hold to the contract or to regard it as abrogated thereby. In the latter event, he sues not on, but in spite of the contract; and recovers not on the contract but in tort."

Mixed Cargo

Our very good friends Bill Henderson and Kirk Smith, former marine managers at San Francisco of the Automobile and Insurance Company of North America, have launched the general brokerage firm of Henderson-Smith, with offices at 1042 Russ Building, San Francisco. We wish them all kinds of success, partly because they'll achieve it anyway, being capable and all that, and partly because they both have that rare faculty of enjoying their daily labors.

Here's hoping that Bill continues to smoke out excellent cigars and accounts, and that Kirk maintains his customary high level in telling the story of the Texas murder trial.

On November 14 last, the Study Class of the San Francisco Marine Underwriters, in accord with its amphibious tendencies conducted its meeting partly on land and partly afloat. Gathering at their ordinary assembly point, the Board of Fire Underwriters rooms in the Merchants Exchange Building, the members listened to a short but in-

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SHIPBUILDING WORK IN PROSPECT

Yacht Planned for Pacific Coast

Henry Gielow, Inc., 25 West 43rd Street, New York, has plans for a large yacht for Fred K. Lewis of the Diamond Bar Ranch, Spadra, California. The yacht will be 130 feet length and powered with diesel engines. Steel will be used in construction and it is considered quite likely that the yacht will be built at a Pacific Coast yard. There are several yards on the Pacific Coast which, through low overhead and favorable working conditions, should be able to compete for steel yacht construction and bring some of it to the Coast.

We have heard reports of another member of the southern California yachting fraternity who is contemplating the construction of a large all-steel diesel-powered yacht, and hope to have particulars to announce shortly.

Award Doubtful on Lightship

To date, no news has been received at the Pacific Coast headquarters of the Bureau of Lighthouses as to what decision will be taken in awarding contract for the construction of Lightship 100, diesel-electric lightship for Pacific Coast delivery, bids for which were received last October. Bids were submitted on one, two, and three ships. Low bid for one ship was submitted by the Albina Marine Iron Works of Portland, with the Elizabeth City Iron Works & Supply Co. of Elizabeth City, N.C., second lowest. Bessemer Gas Engine Co., was low bid for diesel power plants for three ships and the Winton Engine Company was low bidder for one ship.

Tugboat to be Built

Bids were opened at the office of Young Bros., Honolulu, on December 6 for the construction of a 350-horsepower diesel engine tugboat, 125 feet length. Engine is being constructed by Fairbanks, Morse & Co.

Standard Oil Tanker

Of interest to shipyards in America is the decision of the Standard Oil Company (Calif.) to use the Busch-Sulzer diesel engines and Westinghouse motors, Northern pumps, and electric auxiliaries, ordered for use in converting the

tanker District of Columbia, in a new tanker, the design of which will necessarily be drawn very carefully to fit the machinery now completed and ready for installation.

New Barge for Puget Sound

The Marine Department of the General Petroleum Corporation of San Francisco is preparing plans for a tank barge for its Seattle branch, to be used in the distribution of oils and distillates in the Puget Sound district. Plans will be ready about the middle of January.

May Build New Police Patrol

Although no demands have yet been made on the City Supervisors for funds, it is understood that the San Francisco Police Commission is hoping soon to ask for authority to purchase or construct an up-to-date and speedy patrol boat for San Francisco harbor. The one now in use has been in service for many years, and is in many ways inadequate for the work.

Fireboat Plans for Vancouver Materializing

The Vancouver City Council has under consideration plans for a fireboat for the protection of shipping at False Creek. The boat has been designed by Arthur Bennett, will be 60 feet long over-all, 15 feet beam, and 3 feet draft, fitted with gasoline engines and with a pumping capacity of 5000 gallons a minute at 120 pounds pressure. The financing of the construction will be handled by the Vancouver City Council, the False Creek Property Owners' Association paying for the boat on the installment plan.

Powerful Tugs To Be Built

The Great Lakes Dredge & Dock Co., Chicago, is reported to be calling for bids for the construction of a diesel-powered tugboat of 1000 horsepower. The boat will be built on the Great Lakes or Atlantic Coast.

The Long Island Railroad Company, New York, has retained Eads Johnson, naval architect, 115 Broadway, New York, to draw up plans and specifications for a diesel-electric tugboat.

Bids Called on Diesel River Boats

Henry J. Gielow, Inc., naval architect, of New York, has issued plans and specifications for two passenger and automobile vessels for the Hudson River Navigation Company, Pier 32, North River, New York, for operation by the Hudson River Night Line on its New York-Troy-Albany run.

The vessels will be 300 feet long, 50 feet beam, and 16 feet depth, with diesel engines developing a speed of 16 knots.

Motor Tank Liners Planned

Several American petroleum companies are working on plans for tankers for the carriage of their products. Among them, the Union Oil Company of California, with headquarters at Los Angeles, is planning a tanker of about 10,000 tons carrying capacity.

The Sun Oil Company of Philadelphia is reported to be planning the construction of a 10,000-ton tanker, and the Cities Service Company of New York is said to be planning a 13,000-ton oil carrier.

A Large Yacht Order

Theodore E. Wells, naval architect of New York, at 33 Rector Street, called for bids to be submitted Dec. 17 for the construction of a twin-screw, steam-electric yacht, 263 feet length, 30 feet beam, 18 feet 6 inches depth.

Tugboat Planned

The Philadelphia & Reading Railroad Company is reported to be planning the construction of a 500-horsepower diesel tugboat.

Bids Asked on Two Colliers

The Berwind-White Coal Mining Company of New York, has issued plans and specifications and asked American yards to bid on the construction of two colliers to be equipped to burn pulverized coal. Theodore E. Ferris, New York, is the naval architect.

The vessels will be 391 feet long, 50 feet beam, and 23 feet 6 inches loaded draft. They will have G.E. turbines, fitted with reduction gears, and water-tube boilers developing a pressure of 400 pounds and a steam temperature of 700 degrees Fahrenheit. They will be self-loading and self-unloading, and will carry 6500 tons of coal. It is reported

and that they will be the first under contract. The conversion will cost estimated about \$1,000,000 and is being carried forward by the Admiralty.

New Fishing Boat Planned

According to reports from the Admiralty, a new fishing boat, the Prince Rupert, British Columbia, is planned. The boat will be 100 ft long and 20 ft wide.

The Admiralty has proposed to the House of Commons that the conversion of the four Comanches, ordered in 1914, should be the responsibility of the Admiralty. The conversion of the four Comanches is estimated at \$1,000,000.

Shipping Board to Convert Three Boats

Plans for the conversion of three ships into the new type of auxiliary ship, the Comanche, have been completed by the Admiralty. The three ships, the Comanche, the Comanche, and the Comanche, will be converted into auxiliary ships. The conversion of the three ships is estimated at \$1,000,000. The conversion of the three ships is estimated at \$1,000,000.

Indications are that the Comanche will be converted into auxiliary ships. The conversion of the three ships is estimated at \$1,000,000. The conversion of the three ships is estimated at \$1,000,000. The conversion of the three ships is estimated at \$1,000,000.

The electric equipment for this vessel will be furnished complete by the Comanche Company. The main generators will be four 300-kilowatt, 250-R.P.M., 375-volt,

horizontal and vertical. All electric equipment for 2,000-hp. will be supplied by the Comanche Company. The conversion of the three ships is estimated at \$1,000,000.

Phoenix Steamship Company Plans New Lines

O. H. Newman, from New York City, has been named as the new manager of the Phoenix Steamship Company. The Phoenix Steamship Company is planning to convert three ships into auxiliary ships. The conversion of the three ships is estimated at \$1,000,000.

Government Takes Over Saratoga

The U. S. Navy has taken over the Saratoga, a 33,000-ton vessel, for conversion into a flying boat carrier. The conversion of the Saratoga is estimated at \$1,000,000. The conversion of the Saratoga is estimated at \$1,000,000.

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The flying deck extends over the length of the ship, with no obstructions except on one side where a massive combined funnel enclosure houses masts, uptakes, turrets, and other structure. The beam of the flying deck is 100 ft wide, and will carry more than 3000 officers and men, and will have a complement of 83 planes, including three squadrons of 16 fighting planes each, two squadrons of 16 observation planes, and one squadron of three utility planes.

The vessel is propelled by electricity, using a turbine generating plant of 10,000-hp. capacity.

CUNNINGHAM

MARINE AUXILIARY EQUIPMENT

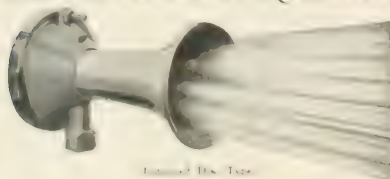


Illustration of the Type

COMPRESSED AIR WHISTLES

Made in 5 sizes suitable for all sizes and types of Motor Boats and Ships. Operates on any pressure from 10 lbs. to 300 lbs.

More Noise with Less Air Unequalled Echoing Qualities True Whistle Tone

ALLAN CUNNINGHAM

800 Railroad Ave. So. 128 Market Bldg.
SEATTLE, Wash. SAN FRANCISCO, Cal.
Small Sizes Carried in Stock in California by
E. H. Hoken & Co. San Francisco & Wilmington
San Diego Marine Supply Co. San Diego
The McCaffrey Co.

equipment and auxiliaries supplied by the General Electric Company. Its power plant will have a maximum rating of 180,000 horsepower, and the propellers will be driven by

eight 22,500-horsepower motors, two being connected to each propeller shaft. Steam for the turbines will be generated by 16 oil-fired burners.

SOME RECENT SHIPBUILDING CONTRACTS

James M. Campbell, Mobile, Alabama, has an order from Captain Joseph Pose and associates of Mobile for a freight and passenger boat to be powered with a diesel engine.

Newport News Shipbuilding & Drydock Company, Newport News, Virginia, has an order from the Chesapeake & Ohio Railway Company for a tugboat 109 feet over-all, 28 beam, and 14 feet 6 inches depth; single screw, powered with triple expansion engines and equipped with Scotch boiler, coal burning. Keel is to be laid in January.

Federal Shipbuilding & Drydock Company, Kearny, New Jersey, has an order for the construction of a barge for the Oil Transfer Corp., 160 by 36 by 11.5 feet, built on the Isherwood System of bracketless framing.

The Middlesex Transportation Company of New Brunswick, New Jersey, is having constructed an electrically propelled packet boat, designed by Eads Johnson of New York. The boat will be powered with two 250-horsepower Winton diesel engines, each to drive a 165-kilowatt, General Electric generator.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., has an order for two dump scows for the Great Lakes Dredge & Dock Co., Chicago,

223 feet length; 42 feet 4 inches beam, and 15 feet depth. This yard also has an order for two derrick hulls for Fitzsimmons Connell Dredge & Dock Co., Chicago, one to be 100 feet length, and one 120 feet length.

New Diesel-Electric Freight Boat

Naval Architect Eads Johnson of New York has designed and is superintending the construction of a diesel-electric packet boat under construction by the Bethlehem Shipbuilding Corporation, Quincy, Massachusetts for the Middlesex Transportation Company of New Brunswick, New Jersey, for operation between New Brunswick and New York. The boat will be electrically equipped throughout, power being supplied through two Winton diesel engines of 250 horsepower each, driving twin 165-kilowatt, 250-volt General Electric direct-current generators. The boat will have a cargo capacity of 250 tons and speed of 12 miles an hour.

Bath Iron Works, Bath, Maine, has an order from Henry J. Gielow, Inc., naval architect of New York, for an all steel diesel yacht, 240 feet over-all; 36 feet beam; 14 feet 6 inches draft; two 1500-horsepower Bessemer diesel engines; 16 knots speed.

After having been closed down and partially dismantled for over a

year, the Bath Iron Works, Bath, Maine, has recently been opened, with President and General Manager Newell again in charge. The yard is said to have several good contracts for steel yachts.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Mass., has an order from the New England Steamship Co., Newport, R.I., for a steel passenger steamship about 210 feet long and with passenger accommodation of 2000.

This plant also has an order from the Pennsylvania Railroad Co., West Philadelphia, for the construction of a 300-foot steamship.

Fellows & Stewart boat yard, San Pedro, has an order for a 60-foot express cruiser for A. W. Jackson of San Francisco to be powered with three 400-horsepower motors.

REPAIRS

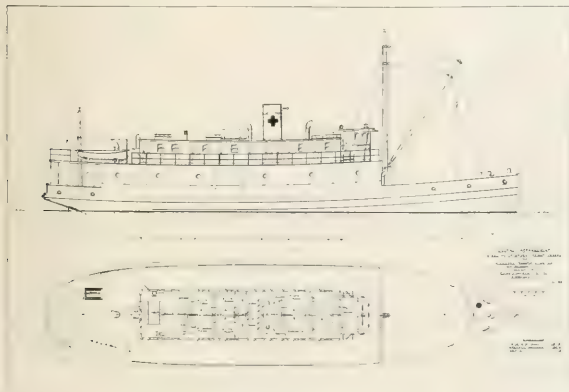
Albina Engine and Machine Works, Portland, Oregon, was awarded contract for rudder damage repairs to the steamship Horace Luckenbach, recently damaged in the Columbia River. Work will cost \$9750.

Robert McIntosh Engine and Machine Company and the **Commercial Iron Works**, both of Portland, Oregon, were recently awarded a contract by the United States Shipping Board for repairs to the steamship Wawalon to put the vessel into condition for spot service.

Bethlehem Shipbuilding Corp., Union Plant, Alameda, Calif., is remodeling the old monitor Monterey into a whaler and reduction plant, acting as mother ship to a fleet of trawlers.

Lake Washington Shipyard, Houghton, Wash., on a bid of \$8950, was awarded contract for improvements to the steamship W. M. Tupper owned by the Santa Ana Steamship Company of Seattle.

Newport News Shipbuilding & Drydock Co. has been authorized to make additional improvements to the staterooms and other passenger accommodations of the Steamship America, which is being reconditioned at Newport News for service on the United States Lines. The improvements authorized are in addition to those previously planned for in reconditioning the ship, and will result in making the vessel one of the finest and most luxuriously appointed cabin vessels in the North Atlantic passenger service. The reconditioning of the Steamship America is rapidly nearing completion and the vessel is expected to make a sailing in March.



Packet boat building by Bethlehem's Fore River plant for the Middlesex Transportation Co.

SIMPLEX

Marine Valve

Invention No. 19

Pressure Reducing Valve



ESSENTIAL TO BOARDS
The War's Increasing Value
BATTLE-PROVEN

Install in Any Engine

See Details Circular

G. E. Witt Co., Inc.

842 1/2 BROADWAY STREET
SAN FRANCISCO CALIF.

newly organized Shipbuilding Corp. will build from 100,000 tons to 10,000 tons, to meet increasing requirements in commerce. American shipbuilding is now being done in Japan, Germany, Great Britain, Italy, France, Russia, and Japan, and the United States is being outdone in the Pacific Ocean. The new shipbuilding corporation will build from 100,000 tons to 10,000 tons, to meet increasing requirements in commerce. American shipbuilding is now being done in Japan, Germany, Great Britain, Italy, France, Russia, and Japan, and the United States is being outdone in the Pacific Ocean.

FREE SAVINGS

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LAUNCHINGS

Three launches were launched at the shipyard of the Pacific Marine Iron Works Co., 1000 Broadway, San Francisco, Cal., Dec. 1.

DELIVERIES

Three launches were delivered to the Pacific Marine Iron Works Co., 1000 Broadway, San Francisco, Cal., Dec. 1.

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New Incorporations

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Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of December 1st.

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
LONDON, ENGLAND

Portland, Ore., Nov. 1917

Construction of the shipbuilding corporation will build from 100,000 tons to 10,000 tons, to meet increasing requirements in commerce. American shipbuilding is now being done in Japan, Germany, Great Britain, Italy, France, Russia, and Japan, and the United States is being outdone in the Pacific Ocean.

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COMMERCIAL IRON WORKS

ENGINEERS - FOUNDERS
MACHINISTS

MARINE REPAIRS

UNION AVE. & STEPHENS ST.

PORTLAND, ORE.

ALBINA MARINE IRON WORKS

Marine and Shipbuilding Iron Works, Portland, Ore., 1000 Broadway, San Francisco, Cal., Dec. 1.

Hough & Egbert

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San Francisco

Marine Surveyors

Consulting Engineers

Plans, Specifications, Supervision

Bureau Veritas, Supervisors

Sales Agents

for

Marine Equipment

Representing:

BRIDGEPORT BRASS COMPANY
Condenser Tubes.

C. M. LANE LIFE BOAT CO.
Life Boats.

R. H. LAVERIE & SONS, Inc.
Material Testing and Inspection.

PRESCOTT IRON WORKS
Prescott Tractors.

WALTER KIDDE & CO., Inc.
Rich Smoke Detecting System.
Lux Fire Extinguishing System.

"HANDY" VICTORY FLUSHO-
METER VALVES.

HOUGH PATENT BOILER FEED
CHECKS.

DOUBLE SEAL PISTON RINGS.

PARKE & KIBELE

INCORPORATED

Successors to
San Pedro Marine Engine Works

Engineers and Machinists

SHIP REPAIRS OF ALL KINDS

Manufacturers of

"Kibele Straight Line Boiler
Feed Water Controls"

"Tobin Commercial Gas Burners"

"Kibele Automatic Steam Atomiz-
ing Oil Burners"



Berth 94

San Pedro, Calif.

3 400 H.P. Ingersoll-Rand diesel engs;
Westinghouse 950 S.H.P. motors, keel
Oct. 25/27 est.; deliver March 1/28 est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Reed No. 6, scow for Feed Mill Co.,
Shelton, Wn.; deliver Oct. 6/27 est.

Hull 122, scow for stock, 100x36 x
9'6"; launched July 29/27.

Hull 123, scow for stock, 100x36x9'6";
launched Aug. 3/27.

Hull 124, self-dumping gravel scow for
Pioneer Sand and Gravel Co., Seattle; 100x
36x11 ft.

Crane, hull 125, patrol boat for U.S. Bu-
reau of Fisheries. Seattle; 90 L.B.P.; 20
beam; 13'5"; loaded draft; 200 H.P. Wash-
ington-Estep diesel engs.

Not named, hull 134, twin screw cannery
tender; for Northern Light Packing Co.,
Cordova, Alaska; 55 L.B.P., 13 beam.

Hull 135, fish scow for Alitak Packing
Co., Seattle; 55 by 18 by 4 ft.

Hull 136, same as above.

Hull 137, fish scow for P. E. Harris &
Co., Seattle; 60' long by 16' beam.

Hull 138, same as above.

Hull 139, port scow for P. E. Harris &
Co., 28'x10'x10'.

Hull 140, same as above.

PACIFIC COAST ENGINEERING CO.,
Oakland, Calif.

Alki, hull No. 4, fireboat for City of
Seattle; 123 L.O.A.; 26 moulded beam, 7'6"
draft; 14 knots speed; seven 6-cyl. 300-H.P.
Winton diesel engs.; keel July 7/27;
launched Nov. 5/27; deliver Dec. 15/27
est.

PRINCE RUPERT DRYDOCK &
SHIPYARD,
Prince Rupert, B.C.

One pile drive scow for Pacific Stevedor-
ing Co.; 60x20 ft.

U. S. NAVY YARD,
Bremerton, Wash.

Not named, light cruiser CL-28 for Unit-
ed States Navy, 10,000 tons displacement;
deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twelve barges for Tennessee Coal, Iron
and Railway Co., Birmingham, Ala.; 140x
25x11ft.; 3 delivered.

AMERICAN BROWN-BOVERI

ELECTRIC CO.,
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Salt Lake City, light cruiser for United
States Navy; 10,000 tons displacement; de-
liver July 9/29 est.

Not named, light cruiser CL-27 for
United States Navy, 10,000 tons displace-
ment; deliver June 13/30 est.

Hull 373, cement barge for International
Cement Corp.; 163'x6'x37'4"x13'; keel
Oct. 1/27; launch and deliver Dec./27 est.

THE AMERICAN SHIP BUILDING
COMPANY,
Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.
Robert W. Stewart, hull 802, tank steam-
er for Standard Oil Co. (Indiana); 373 L.
B.P.; 52 beam; 20 loaded draft; 12 mi. load-
ed speed; 6200 D.W.T.; 1800 I.H.P., triple
expansion engs., 2 Scotch boilers, 15'x4½"
x11'6"x180 lbs. pressure; keel Aug. 29/27.
Not named, hull 803, motor tanker for
F. C. Wright, 334 feet L.B.P., 51 feet
beam; 18 loaded draft; 11½ mi. loaded
speed; 3700 D.W.T.; 1900 I.H.P. Werk-
spoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Lexington, hull 1300, airplane carrier U.
S. N., launched Oct. 3/25.

No. 45, electric cutter for U. S. Coast
Guard Service; 250x42x15 ft.; Westing-
house turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, diesel-electric freighter for
Midexcess Transportation Co., New Brun-
swick, N.J.; 131 x 31 x 11 ft.; Winton-Gen-
eral Electric machinery; electric auxiliaries;
12 mi. speed.

Not named, steel passenger and freight
steamer for the New England Steamship
Company, Newport, R.I.; 202 L.B.P.; 36
molded beam; 14'6" molded draft; 1082
gross tons; 4 cyl. TE eng.; B. & W. boilers,
coal burning.

Not named, steel passenger and freight
steamer for the Pennsylvania Railroad
Co., West Philadelphia; 300 ft. length;
TE engs.

CONSOLIDATED SHIPBUILDING
CORPORATION

Morris Heights, N. Y.

Hull 2892, day cruiser for A. V. Davis,
34' length; 180 H.P. Speedway engs.

Hull 2895, day cruiser, 50 ft. for stock;
180 H.P. Speedway engs.

Hull 2896, cruiser for Paul H. Dem-
ming; 2-155 H.P. Speedway engs.

Hull 2897, cruiser for C. E. F. McCann,
95 ft.; 2-300 H.P. Speedway engs.

Hull 2898, cruiser for J. L. Parsons, 82
ft.; 2-300 H.P. Speedway engs.

Hull 2900, cruiser for R. L. Skofield,
64 ft.; 2-155 H.P. Speedway engs.

Hull 2901, tender for J. H. Seaman,
19'6"; 1-25 H.P. Speedway eng.

Hull 2903, cruiser for New York yacht-
man, 64 ft.; 2-155 H.P. Speedway engs.

DEFOE BOAT & MOTOR WORKS,
Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.

Grathia II., hull 125, yacht for E. T.
Strong, Flint, Mich.; 57'x13'x4'; 13 mi.
loaded speed; 22 D.W.T.; 200 I.H.P. gas
engs.; keel Aug. 1/27; launch and deliver
Apr. 1/28 est.

Not named, hull 123, steel yacht, owner
not named; 105 L.B.P.; 17 beam; 6 loaded
draft; 13 loaded speed; 110 D.W.T.; 120
I.H.P. diesel eng.; keel July 11/27; launch
Apr. 15/28 est.; deliver June 1/28 est.

H. W. CROZIER, M.E. E.E.

Consulting Engineer, Specializing in

DIESEL ENGINEERING

Specifications, Supervision, Surveys - Tests. Diesel-electric, Diesel - Fuels and Lubricating Oils.
HOLBROOK BUILDING SAN FRANCISCO

Cables-Radio, "CROSIENGER."

keel Aug. 15/27; delivered Nov. 15/27.

Hull 130, same as above; keel Aug. 15/27; delivered Nov. 15/27.

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5' loaded draft; keel Aug. 25/27; delivered Nov. 15/27 est.

Hull 133, deck barge for stock; 160x39x7 ft.; keel Nov. 15/27 est.; launch Dec. 15/27 est.

Hull 134, deck barge, for stock; 100x24x5 ft.; keel Oct. 15/27; launched Dec. 1/27.

Hull 135, deck barge for stock; 100x24x5 ft.; keel Oct. 25/27; launch Dec. 10/27 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer. 233 Broadway, New York City.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gross tons; 17,000 I.H.P.; keel Mar. 20/26; launched Oct. 1/27; deliver Jan. 14/28 est.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel Apr. 28/27; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement; keel Aug. 28/27; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27 launch Mar. 28/28 est.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line: 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water tube boilers; keel Nov. 14/27.

W. J. Hanahan, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14'6" depth; one screw; T.E. eng.; Scotch boiler; coal burning; keel Jan./28 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

Savarona, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect. New York; 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel engines; total of 3000 H.P.; keel Apr. 1/27; launched Sept. 12/27; deliver Jan. 1/28 est.

Not named, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18 1/2 mi. speed; 1784 gross tons; 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27.

Not named, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139'9" L.W.L.; 22 beam; 17'6" loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; keel Oct. 15/27; launch Jan. 15/28 est.; deliver May 1/28 est.

One barge for Acme Construction Co.; 77 x 22 x 4 ft.

SUN SHIPBUILDING COMPANY

Chester, Penn.

Purchasing Agent: H. W. Scott.

Sun Oil Co.; hull 106, motor tanker for Sun Oil Co.; 480' x 65'9" x 37'; 13,000

D.W.T.; 2800 S.H.P. at 80 R. P. M.; 4 cyl., 2-cycle Sun Doxford engs.; keel May 2/27; launched Oct. 22/27; deliver Dec. 15/27 est.

Not named, hull 107, tanker for California Petroleum Co.; 510'x70'x40'; 17,000 D.W.T.; 4500 S.H.P. at 82 R.P.M., 8-cyl., 2-cycle Sun-Doxford eng.; keel July 5/27; launch Dec. 17/27 est.; deliver Feb. 10/27 est.

Hull 108, carfloat for Pennsylvania Railroad; 330'x38'x10'6"; keel June 30/27; launched Oct. 21/27; delivered Nov. 17/27.

Hull 109, same as above; keel June 30/27; launched Oct. 29/27; delivered Nov. 17/27.

Not named, hull 110, motor tanker for Sun Oil Co.; 480 L.B.P.; 65'9" beam; 37' draft; motive power not yet determined; keel Jan. 12/28 est.

TODD DRYDOCK, ENGINEERING & REPAIR CORP.

Brooklyn, N. Y.

Purchasing Agent: H. J. Shannon.

Greenwich Village, hull 40, diesel-electric ferryboat for Dept. of Plant & Structures. City of New York; 101 ft. 6 in. length over guards; 27 ft. 7 in. beam; 6 ft. 8 1/4 in. loaded draft; 300 I.H.P. Nelsco diesel engine; keel Apr. 14/27; launched July 19/27.

Mott Haven, hull 41, diesel-electric ferryboat, sister to above; keel Apr. 14/27; launched July 19/27.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

F. H. Hilliard, hull 62, diesel powered stern wheel survey boat for Mississippi River Comm., Dredging Dist., Memphis, Tenn.; 139'6"x24'x5'3"; keel June 2/27; launched Sept. 19/27; deliver Dec. 12/27 est.

Tecumseh, hull 63, steel hull diesel-electric stern wheel towboat for U.S. Engineers, St. Louis; 110x23x5 ft.; Lombard, 300 B.H.P., 400 R.P.M. eng.; General Electric motors and equipment; launch Dec. 31/27 est.; keel Sept. 22/27.

General Humphreys, hull 64, steel hull inspection boat for U. S. Engineers, New Orleans; 85x18x7 ft.; diesel eng.; single screw; keel Nov. 28/27.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD.,

Union Plant.

Drydock, paint, misc. repairs: Maui, Manukia, barge Martinez, tug F. A. Dooty, Matsonia, F. H. Hillman, Point Reyes, Point Montara, Manulani, tug W. B. Storey, ferry Solano, Water Nymph, m.s. Madra, schr. Carlos, m.s. Jacksonville, Esparta, Point Bonita, Shell Barge No. 6, stmr. El Segundo, Los Alamos, San Lorenzo, New Britain, Regulus, tug Humboldt, schrs. Hartwood, Caspar, Propeller repairs: Newport, schrs. Katharine, Donovan, stmr. West Cape, New Britain, schr. Hartwood.

Turbine repairs: H. F. Alexander, Malolo, New capstan, schr. Solano, Damage repairs to propeller and tailshaft: schr. Hartwood. Forged steel tailshaft: D. G. Scofield. Make and furnished two cast iron gypsies: Maersk Hercules. One tailshaft: Chastine Maersk. Misc. repairs: stmr. Point Reyes, Felix Taussig, Malolo, San Ma-

point, Finland, Tahiti, Benjamin Franklin, Manchuria, La Perla, Tascasula, General Smuts, Lebec, San Nazario, I. S. White. El

Oso, Deroche, Nora, Gold Shell, Emidio, La Placenta, Chibbar, Canada, Kiyu Maru, China Arrow, Scotch Strath, Oleum, Mojave, Larry Doheny, U.S.S. Medusa, Cliona, Kekeskee, San Gaspar, W. S. Rheem, Malino, tug Restless, schrs. John Poulsen, Bandon, John C. Kirkpatrick, whaler Port Saunders.

COLLINGWOOD SHIPBUILDING CO.,

Collingwood, Ontario.

Purchasing Agent E. Podmore.

Bottom damage repairs: stmr. Arthur Orr. 45 ft. of new keel, tail shaft examination: stmr. Manitou. Caulking sea cock: stmr. Caribou.

GENERAL ENGINEERING AND DRY DOCK COMPANY,

Alameda, Calif.

Dock, clean, paint, misc. repairs: tug Standard No. 1, gas s. Avon, stmr. Henrietta (renewed hardwood stem), stmr. Achille Paladini, Noyo (also deck and engine repairs), ferry Golden West (also changing wheels, rewinding, damage repairs), Western Union Boat, stmr. Suez, Pyramid (general overhaul), El Agador, Brunswick (deck and engine repairs, new tail shaft), Deck and engine repairs: stmr. Sutherland, W. R. Chamberlin, Jr. (misc. damage repairs), Buffalo Bridge (also boom and winch alterations), Dry dock: m.c. Iris A. Dry dock, overhaul steering gear (damage repairs): ferry Golden Poppy, Alterations and repairs, dry-docked: West Errol.

LOS ANGELES SHIPBUILDING & DRY DOCK CORP.,

San Pedro, Calif.

Voyage repairs: stmr. Shabonee, West Islip, Tulsagas, Mericos H. Whittier. Bottom repairs: barge Sampson. Clean and paint: barge William Muller, yacht Volero II, yacht Volador, m.s. Canadotte (also rudder changes). Seasonal preparation: whalers Norrona II, Columbus, Hanka.

Repairs to hull: whaler Traveler. Semi-annual repairs: stmr. Calawai, Ruth Alexander. Shaft repairs: m.s. Hinnoy. Preparation for race to Hawaii: yacht Talahya.

PRINCE RUPERT DRY DOCK AND SHIPYARD,

Prince Rupert, B.C.

Docked, cleaned, painted, misc. repairs: stmr. Prince John, Prince Charles (annual overhaul). Lined for grain loading: stmr. San Francisco Maru. Repairs to quadrant: C.G.s. Birnie. Misc. repairs: stmr. Fish-pool. Docked, cleaned, painted, misc. hull and engine repairs to 7 fishing boats: misc. repairs to 25 fishing boats; 72 other commercial jobs.

TODD DRY DOCKS, INC.,

Seattle, Wash.

Reconstruction and alterations: Comfort. Hull repairs: stmr. Corrales, Wheatland Montana. Engine repairs: stmr. Pardo. Voyage repairs: stmr. President Jackson. Misc. repairs: stmr. Charles McCormick, Indianapolis, Edward Luckenbach, g.b. Contra Costa.

U. S. NAVY YARD,

Bremerton, Wash.

Misc. repairs and drydocking: Maryland, Omaha, Cuyama, Farquhar, Zeilin, Wood. Thompson. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

VICTORIA MACHINERY DEPOT CO.,

Victoria, B.C.

Dock, clean, paint, repairs: Three scows, stmr. Princess Mary and Princess Royal (also hull, engine, and deck repairs), C.G.s. Armentieres (also hull repairs). Boiler repairs: C.G.s. Estevan. Boiler and deck repairs: tug Spray. Deck repairs: tug Restless. Tail shaft repairs: stmr. Nootka.

Steamship Company Distributes 60,000 Calendars

Most of the nation's 100 calendars, which feature a different scene each day, are produced by the same company, the American Calendar Company, based in New York City. The company's president, John H. H. H. H., is the only person in the world who has been named "Calendar Man" by the *Time* magazine.

Abstract.—Habitat management for wetland biota and legumes is needed. The community working around there put its major focus that there be no growth of *Spartina* in the stopping marsh. The habitat group had been used to manage marsh, as assessed. But the biota management systems are being.

company, together with a calendar-pad for 1984. The calendar-pad is a 12-month calendar with a space for notes and a space for a small photograph. The calendar-pad is a 12-month calendar with a space for notes and a space for a small photograph. The calendar-pad is a 12-month calendar with a space for notes and a space for a small photograph.

of the old calendars has been retained, in some instances even accentuated, and the additions as well as the changes are usually very appealing from an artistic as well

Horn. This line was finally merged in the present company, which was incorporated twenty-nine years ago. The company has since that time been known as the Hawaiian Mail, and which took its name from the fact that until the beginning of the war the company's steamers made regular calls at Hawaii for sugar

With the completion of the Tehuantepec National Railroad in 1907, the company's fleet was divided into the Atlantic and Pacific units, and from then until the completion of the Panama Canal in 1914, cargo was transferred across the Isthmus

On September 16, 1991, President Bush announced the new Social Security "lockbox" to the Social Security Board. The lockbox was designed to ensure that the government had the necessary resources to meet the Social Security Board's obligations. The lockbox was designed to ensure that the government had the necessary resources to meet the Social Security Board's obligations. The lockbox was designed to ensure that the government had the necessary resources to meet the Social Security Board's obligations.

The University of Maryland System's Climate Center supports a wide range of research in climate science. Through the National System of the 1000 Grid, the University is a member of the National Climate Data Center.

New Design Turbo-Generating Sets

Allison, the new director of the new, government-sponsored, nonpartisan Institute for Legal Studies and Economic Studies, will be installed in August. Formerly, from 1984 to 1990, she worked for the executive branch to help Ronald Reagan, George Bush, and Bill Clinton achieve legislative goals. The Institute, at 400 North Dearborn, is still in

The sets are being installed in the new building, which will be completed in 1936. The sets will be used for furnishing light and auxiliary power. The twenty-four sets are being built by the General Electric Com-

The design to which this generating equipment is being built is a direct result of the 1921 Limitation of Arms Conference. As any cruiser designed after the conference must not exceed a life of the treaty must not exceed a weight of 10,000 tons, it is imperative that the present cruisers must be designed to obtain the maximum amount of cruising radius, the highest speed, and the greatest fighting power for such

Accordingly, a complete new design of turbine-generator set was evolved by the General Electric Company, based on the conditions required, which probably surpasses anything thus far proposed for navy work in meeting these severe requirements. The turbine operates at 10,000 revolutions per minute, driving the generator through gears at 1200 revolutions per minute. The foundation, instead of be-

Stenotaphrum secundatum (L.) Nees is common in France, and all negative for any one of the 10 herbivores and the 100 lines of single-insecticide treatment. Insecticide and herbicide treatment do not inhibit growth of a species just before the flowering period, causing only slight stem elongation.

[illegible]

Trade Notes

The A. C. Reduction Co., Inc., 32 Madison Avenue, New York, has acquired the assets and business of the Carolina Standard Gas Products Company, with an oxygen plant at Charlotte, N. C. Carolina The A. C. Reduction Sales Company now has the production and distribution facilities of 16 oxygen plants and 20 acetylene plants. These, with warehouses, give the company a total of 110 distributing points for oxy-acetylene gases, equipment, and supplies.

The Brown Instrument Company wishes to announce the opening on November 1, 1927, of a San Francisco office at 537 Holbrook Building, under the supervision of C. L. Peterson, sales engineer.

New Building for Yacht Club

Plans have been approved for the construction of a new clubhouse, wharf, garages, for the Los Angeles Yacht Club on a site leased from the Los Angeles Harbor Board on the new beach inside the breakwater at Point Fermin, San Pedro.

The St. Francis Yacht Club, San Francisco, has also announced completion of plans for the construction of its clubhouse and boat ways.

Practical Lubrication *Service* IN PACIFIC COAST PORTS



San Francisco

ALL SHIPS entering San Francisco Harbor can enjoy the advantages offered by Associated Practical Marine Lubrication Service.

They are—

Plants and offices easily accessible to all docks and shipyards.

Prompt deliveries at any hour of the day or night—your ship can be met as you dock if you wish it.

A complete line of Avon sustained quality Marine Lubricants for every use on shipboard.

And remember that this service is uniform in every Pacific Coast port that has an Associated "service station of the sea."

Use this service that is "really practical"



ASSOCIATED OIL COMPANY

Makers of Sustained Quality Marine Lubricants

Avon Mardex Avon Tropdex
Avon Marine Engine Oils
Avon Steam Cylinder Oils
Avon Dynamo Oils
Cyclo Oils for Diesel Engines

Avon Aquadex Avon Nepdex
Avon Refrigerator Oils
Avon Compressor Oils
Avon Turbine Oils
Cyclo Motor Oils and Greases



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on Every 'Drum'

bringing HAWAII 36 hours nearer to San Francisco — Express Service, 4 days to Honolulu and 4 days to the mainland.

The "Music" Lane's choice of HOLZAPFEL & COMPOSITIONS can be found on the bottom of their present and former vessel reflects the owner's confidence in our Compositions which were first used on the bottom of the Company's ship bark "ANNIE JOHNSON" many years ago, and uninterruptedly since that time to the exclusion of all other brands with the exception of several notes of the product of other manufacturers.

Holzapfels Compositions

Pacific Coast Representatives

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25 BROADWAY

NEW YORK CITY

PLEASE MENTION PACIFIC MARINE REVIEW

Trade and Traffic Trends

Shipping and Our Foreign Trade

By Edward C. Plummer, Vice-Chairman, United States Shipping Board*

THE United States Shipping Board was created by Congress in 1920. Its duties were explicitly stated in the Act creating it. As those duties involved all parts of the country, Congress provided that all parts of the country should be represented on the Board. Therefore, the Act calls for two commissioners from states bordering on the Atlantic, two from states bordering on the Pacific, one from states bordering on the Gulf, one from states bordering on the Great Lakes and one from the great agricultural states of the interior. The Act sets forth that its purpose is to have the greater part of cargoes going out of and coming into the United States carried in American vessels. To that end, the Board was instructed to establish necessary services by government vessels ultimately to be privately-owned and operated.

Realizing that the comparatively high cost of building and sailing vessels under the United States flag precluded the taking over and successful operation of such ships by private companies without government assistance, Congress, in the same Act that created the Shipping Board, provided for liberal government aids to make possible the sale to, and the successful operation by, private parties of the services which the Board might establish in this country's foreign trade.

Among these aids were railway preferentials on cargoes for and from United States vessels; the limiting to United States vessels of trade between the United States and the Philippines; and a modification of commercial treaties, to make possible a restoration

of our former preferential duties and tonnage taxes commonly, though inaccurately, referred to as discriminatory duties. Such were the conditions and such were the sailing orders under which the United States Shipping Board began its present voyage in June, 1921.

Big Problem Handed Board

Upon taking office, the Board was handed a variety fleet of some 2500 vessels, about 1000 of which were being operated in one way or another. The great era of shipping depression, which has not yet ended, had just begun; and from all sides men who had bought vessels on the installment plan during those boom days before other nations had gotten their merchant ships back into regular service, were turning over vessels to us or asking for aid. Experienced steamship firms likewise were embarrassed; for the government aid, specifically promised in the Act of 1920, had not been made available; and with the passing of boomtimes and abnormal freight rates, those greater ship costs under the American flag, which long before the World War had practically driven our vessels out of our international trade, made themselves felt again; and with an increased force. The most recent data show that cost-handicap to be from five to nine per cent; i.e., when a foreign vessel is making from five to nine per cent, a similar American vessel in the same trade will be just breaking even.

In a recent magazine article, Captain Robert Dollar, eldest of American shipowners and now operating a great fleet of vessels purchased from the Shipping Board, deals among other things with the item of crew wages; and, comparing three similar ships, one under

*Abstract from House Journal for the Chamber of Commerce, Washington, D. C., December 11, 1927, under the caption "The Bureau of Commercial Economics."

SUMMARY OF THE
PERFORMANCE OF THE AMERICAN MERCHANT VESSEL FLEET
IN 1927
(BASED ON DATA FOR THE YEAR ENDING DECEMBER 31, 1927,
AND NOT INCLUDING TONNAGE OF GOVERNMENT VESSELS)

Report U. S. S. B.
Table I.

SHIP TYPE	Number of Vessels		Deadweight Tonnage		Rankers		Total
	Number	Tonnage	Number	Tonnage	Number	Tonnage	
AMERICAN MERCHANT FLEET:							
Under Charter - April 1, 1927	10	1,000,000	104	163,330	71	107,100	1,270,430
Overseas Foreign	10	1,000,000	104	163,330	71	107,100	1,270,430
Coastwise	10	1,000,000	104	163,330	71	107,100	1,270,430
Grand Total	20	2,000,000	208	326,660	142	214,200	2,540,860
Under Charter - April 1, 1927	10	1,000,000	104	163,330	71	107,100	1,270,430
Overseas Foreign	10	1,000,000	104	163,330	71	107,100	1,270,430
Coastwise	10	1,000,000	104	163,330	71	107,100	1,270,430
Grand Total	20	2,000,000	208	326,660	142	214,200	2,540,860
GOVERNMENT FLEET:							
Under Charter - April 1, 1927	10	1,000,000	104	163,330	71	107,100	1,270,430
Overseas Foreign	10	1,000,000	104	163,330	71	107,100	1,270,430
Coastwise	10	1,000,000	104	163,330	71	107,100	1,270,430
Government Service	10	1,000,000	104	163,330	71	107,100	1,270,430
Grand Total	20	2,000,000	208	326,660	142	214,200	2,540,860
Total Government Owned	10	1,000,000	104	163,330	71	107,100	1,270,430
Total American Merchant Fleet	198	1,313,773	1,978	3,000,000	361	5,284,000	10,400,000

*From R. A. Venable.

**From R. A. Venable.



Your Cargo Will Be Well Handled!

SHIPs particularly well adapted for the International Service are with regularity to the Mexican-Mexico, Europe via Atlantic, Australia, Japan, East Indies, West Indies, Hong Kong, Shanghai, and Japan, including Japan, New York. These modern freighters, carrying 10,000 tons of cargo, are equipped for quick, economical handling of cargo. They are also equipped for the McCormick Steamship Company are maintained in all modern Pacific Coast ports, where experts, Agents and Port Supervisors handle cargo. This company's service provides the speed and care required for your business.

Your next shipment via McCormick

McCormick Steamship Company

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General Agent
McCormick Steamship Company

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Coast-to-Coast Service

PASSENGERS AND FREIGHT
SAN FRANCISCO-HAVANA-NEW YORK SERVICE
—LOCAL—
MEXICO, CENTRAL AMERICA, PANAMA AND
COLOMBIA SERVICE

From San Francisco-Los Angeles			From New York-Los Angeles		
SS. Columbia	Dec. 11	11	SS. Columbia	Dec. 11	11
SS. Columbia	Dec. 11	11	SS. Columbia	Dec. 11	11
SS. Columbia	Dec. 11	11	SS. Columbia	Dec. 11	11
SS. Columbia	Dec. 11	11	SS. Columbia	Dec. 11	11

Participating Agents

Ports of call—Mexico: Campeche, San Jose de Guatemala, Amatenza, La Libertad, La Unión, Anapula, Corinto, San Juan del Sur, Panama, Balboa and Cristobal.

Ports of call—Mexico: Manzanillo, Campeche, San Jose de Guatemala, Amatenza, La Libertad, Corinto, Balboa, Cristobal and Havana (continued only), Cartagena and Puerto Colon (Westward only), and New York.

Through Ticket of Passage to and from many ports of North America and to European Ports via New York.

Excellent Passenger Service to All Ports

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100 So. Spring St.



2 PINE ST.
San Francisco, Cal.
10 HANOVER SQUARE
New York City

the American flag, one under the British flag, and one under the Japanese flag, he gives the following figures: American ship.. 47 men—Wages per month...\$3,270.00
British ship 40 " " " " 1,308.00
Japanese ship 36 " " " " 777.00

For a time the Shipping Board endeavored to comply with the direction of law that American ships carry the greater part of American cargoes; but in order to reduce expenses and to give our competitors a larger share of our ocean business which they claimed was so essential to them, the Board took the liberty of reducing services and cutting down the number of ships in operation until now we are carrying less than one-third of the general cargoes going out of and coming into the United States. Experience shows this is as small a percentage of American tonnage as will insure just treatment of American cargoes by those foreign ships which now are carrying more than two-thirds of our export and import cargoes.

Now when the United States Shipping Board tackled its ship sales problem, it found that our Government had built some 2500 vessels, totaling some 14 million tons; and that, after all replacements and other possible deductions had been made, we still had on our hands a surplus of some ten million tons of ships and so deficiency market for them. Most anybody knows that its easy to pump air into an automobile tire when the tire is empty; but when that tire is full the pump goes hard; and if you pump more than a limited amount of air into a tire that's full you'll bust the tire. But we've kept our eyes on the pressure gauge for six years; and during that time we've managed to dispose of some 5 million tons of shipping. And we haven't busted the coastwise shipping of the United States while doing it.

Foreign Shipyards Busy

Now during the past six years, our foreign competitors and their loud speakers in this country have been proclaiming that the seas were over-tonnaged and that our Government's merchant fleet should be scrapped as surplus war materials, so that our neighbors' ships could make more satisfactory profits. But all that time, these same competitors have been keeping their shipyards busy; and since the Armistice, and while they have been so loudly shouting "surplus tonnage" and blaming it on us, they have built more than 6 million tons or about three times the amount of shipping that the Shipping Board and all other Americans now have in the foreign trade. And that immense amount of new tonnage is, of course, of the most improved and economical type specially designed for the several trades it serves. Meanwhile, we have not built a single ship for our foreign trade.

Such freight ships as the Board now has were built as a war measure and were given pre-war speed—some ten knots. The ships which our competitors have built since the war, and now are putting against us, have post-war speeds—12 to 16 knots.

Now freight ordinarily goes to the fast steamer; and just as the Yankee tea ships, while sail dominated the sea, even took some of England's eastern cargoes, because American craft were the fastest things afloat, so the faster ships of our competitors have been steadily reducing the amount of general cargo carried in American vessels; and because the export products of our competitors get the advantage of a faster transportation to market than our slower ships can furnish some of our exports, they have begun cutting into and cutting down the markets for American goods abroad.

Recently, the Department of Commerce issued its

statement of our foreign trade for the month of September, comparing it with the showing of one year ago. You will note that in every trade where the transportation was by ships, there was a marked falling off. Here are the figures:

Exports to Europe:

224 $\frac{1}{2}$ million dollars in September, 1926
211 $\frac{1}{2}$ " " " " " 1927

Exports to South America:

41 $\frac{1}{2}$ million dollars in September, 1926
33 $\frac{1}{2}$ " " " " " 1927

Exports to Asia:

46 $\frac{1}{2}$ million dollars in September, 1926
40 $\frac{1}{2}$ " " " " " 1927

Exports to Africa:

9 $\frac{1}{2}$ million dollars in September, 1926
8 $\frac{1}{2}$ " " " " " 1927

Exports to Oceania:

24 $\frac{1}{2}$ million dollars in September, 1926
12 $\frac{1}{2}$ " " " " " 1927

A total loss of 40 millions of dollars in one month, when compared with the exports of that corresponding month one year ago. Other months have shown some gains, but the symptoms are perfectly evident; and when a surplus of goods piles up in this country, there can be but one result.

Inadequate Government Aid

For sixty years, Congress has realized that the high cost of building and operating American ships created a financial chasm which could only be bridged by Government aid. But whenever Congress has attempted to solve this problem, it has been confused by propositions of theorists or prejudiced advisors who came along, each with blue prints of bridges varying in length from 10 to 50 feet, and argued that with them they could span this 100 foot chasm.

The fact that the outer ends of their bridges would have to rest on air never troubled them. And so, while we've been wasting time considering these toy bridges, our people have had to keep traveling over the profitable toll bridges which our thrifty competitors had built above us; and we kept on traveling over their bridges and paying whatever toll they demanded until the World War compelled us to build a bridge of our own. Now they want that bridge of ours torn down, so that all of our business will have to go over their toll bridges, and they'll have a chance to raise their rates on us again.

An ideal illustration of our toy bridge methods was furnished in 1891. Both the United States and Japan then were facing the problem of creating a merchant marine. Both had full knowledge of the vast Government aids which their competitors had received. The United States finally adopted the little Ocean Mail Act of 1891; but only after trimming it down to the point where its sponsor, the late Senator Frye, warned Congress it would be practically useless for the purposes proposed—and events proved that he was right.

But Japan, realizing that you can't bridge a 100 foot chasm with a 40 foot span, provided for bounties to the builders of marine engines, bounties to the builders of hulls of vessels suitable for the foreign trade, and then subsidies to the owners of resulting ships to be paid while they were engaged in the foreign trade.

The corresponding results from these two pieces of legislation were inevitable—a decrease in the volume of American shipping in foreign trade followed ours so that when the World War came on, we were

(Continued on Page 30)



Edited by Jerry Scanlon

February 1 will witness the return to service of the Matson Navigation Company's liner Maui, which is now in dry-dock at the San Francisco plant of the Bethlehem Shipbuilding Corporation undergoing extensive alterations.

When completed the Maui will take her place as one of the most modern equipped vessels on the Pacific Coast. All passenger accommodations will be completely refurbished, beds being installed instead of berths, with the exception of a few cabins. All rooms will be equipped with running hot and cold water. The smoking room is being enlarged to twice its size, and will be used as a lounge for both men and women. Handsome new furniture, including easy chairs and bridge tables, in keeping with the period architecture of the interior will be installed.

The galley and pantry are being relocated adjacent to the dining room, this being necessary owing to the rearrangement of the main deck on which will be staterooms with private baths. Other new improvements include a barber shop and a beauty parlor.

H. L. Warley, vice-president of the Calmar Steamship Corporation, has returned to his New York home after a tour of inspection on the Pacific Coast. He is also vice-president of the Ore Steamship Company, another subsidiary of the Bethlehem Steel Corporation.

A new face was seen on the bridge of the Panama Pacific liner Mongolia on her last trip to San Francisco. Captain Robert L. Lewis relieved Captain H. A. T. Candy, who will come out in February as commander of the new steamship California.

Captain Lewis is not a total stranger to San Francisco, having made a couple of trips as chief officer of the Mongolia about a year ago. Recently he has been in command of the steamship Montauk in the inter-coastal freight trade. Captain Lewis was on the bridge of the famous old steamer Kroonland when she made her last trip across



Captain Robert L. Lewis, Panama Pacific liner Mongolia.

the Atlantic to be sold to Greek interests for junk. He comes from a long line of seafaring men, his father having sailed with the celebrated Admiral Farragut.

Work has begun on the dismantling of the U. S. S. Philadelphia, the American cruiser which holds the honor of first raising the American flag over the Hawaiian Islands when they were annexed to the United States. The craft was purchased by Learner and Rosenthal and towed to Antioch, California, where salvage operations are in progress.

The Philadelphia was built at Cramps and launched in 1889. In 1891 she was flagship of the North Atlantic Squadron. She engaged in the Spanish-American War. The first Nicaraguan revolution and the Samoan rebellion. Since her retirement she has served as a training ship at Bremerton Navy Yard, and more recently as a prison ship.

H. C. Bradford, veteran Seattle shipping man, who is manager and treasurer of the newly organized Associated Pilots, Inc., which has opened headquarters at 203 Seattle Hotel, was elected an active member of the Merchants' Exchange of the Chamber of Commerce.

Captain H. Bied, Captain D. G. Moore, Captain C. W. Call, and

Captain H. Curry, members of the Associated Pilots, Inc., were elected associate members of the exchange.

The pilots have organized in order to stabilize rates and to have a headquarters where they can be reached by shipowners and operators at all hours of the day and night. The association covers Pacific Coast, Puget Sound and Alaska waters.

Captain C. H. Curry is president, Captain C. W. Call vice-president, and Captain H. Bied is secretary of the organization.

Captain S. Rustad, who is bringing the new Seattle fireboat Alki to this port from Oakland, is a member of the association.

A total of 75 steamers and motor vessels of a gross tonnage of 128,512 and 29 sailing ships of a gross tonnage of 25,401 were lost or condemned during the first quarter of 1927, according to Lloyds. These figures exceed the figures for the quarter ending December 31, 1926. During this period steam and motor vessels condemned or lost totalled 116,632 gross tons and 49 sailing vessels, totalling 26,217. In each instance, the report states, the figures refer to vessels that were totally lost or condemned as a result of bad weather.

The report further states that vessels broken up or condemned during the first quarter of the year as a result of some cause other than bad weather totalled 42 steamers of 108,505 gross tons and 14 sailing vessels of 15,483 gross tons.

The gross reduction from the merchant marine of the world from all causes during the first quarter was 117 steamers of 237,017 gross tons and 43 sailing vessels of 40,884 gross tons. In the previous quarters the totals amounted to 226 steamers and motor ships of 442,301 gross tons and 57 sailing ships of 34,203 gross tons.

Within a few months it is expected San Francisco will be the headquarters of the Pacific Steamship Company. The company is closely affiliated with the Dollar Steam-

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ship Company, with headquarters in San Francisco, and the Pacific Steamship Company has gradually been moving its offices and managing heads to quarters in San Francisco.

Expenditure of \$2,664,900 on San Francisco bay and Northern California inland waters is recommended in the \$55,886,310 asked of Congress by Army Engineers for the next fiscal year. The bill has already been introduced. The bill calls for the expenditure of \$175,000 for improving the west side of the bay and \$600,000 for the development of Oakland Harbor. The balance will be spent on inland waterways. Detailed allotments are as follows:

First San Francisco District: San Francisco harbor, \$175,000; Oakland harbor, \$600,000; Richmond harbor, \$150,000; San Pablo Bay and Mare Island straight, \$475,000; Suisun Bay channel, \$111,500; Humboldt harbor and bay, \$280,000; Noyo river, \$500.

Second San Francisco District—San Joaquin river, \$420,000.

Inland waterways — Redwood creek, \$1000; Suisun channel, \$500; Petaluma creek, \$70,000; San Rafael creek, \$50,000; Stockton and Mormon channels (diverting canal), \$5000; Mokelumne River, \$1400; Sacramento river, \$250,000; Feather River, \$5000; Yuba river (restraining barriers), \$15,000.

The Oakland Traffic Club held their first annual Christmas dinner December 13 at the Leamington Hotel, which was attended by eighty members and visitors. After the banquet short talks were given by the officers and chairmen of the various committees.

The substantial growth of the Oakland Traffic Club, as shown by this dinner, verifies the excellent method upon which this club was founded and is being built. The constitution and by-laws limit the membership to 100, and it has been the endeavor of this club to admit as members men in the traffic world who will make the Oakland traffic club worthy of its name.

Mr. Howard, president of the Oakland Chamber of Commerce, commended the club upon its growth and standing in the community, and also gave a short talk upon the necessity of cooperation between clubs of this kind and the Oakland Chamber of Commerce for their mutual growth and benefit.

The remainder of the evening

was devoted to a fine musical program which was thoroughly enjoyed.

Dr. Max Rotter, one of the world's foremost diesel engineers, and now vice-president of the Busch-Sulzer Diesel Engine Company of St. Louis, has returned to his desk after a tour of inspection of the Pacific Coast. He visited Los Angeles, San Francisco, Portland and Seattle. He was shown about by A. A. Tacchella, Pacific Coast representative for his firm. Dr. Rotter, on his visit to Los Angeles, expressed surprise at the development there, it being his first visit to San Pedro harbor since 1894.



Chief Engineer R. C. Dwyer of the Matsun liner Malolo.

The Alaska Steamship Company's steamer Northwestern, which went on the rocks December 11, ten miles south of Campbell River, British Columbia, is a total loss. Passengers were rescued during the storm by a halibut boat and proceeded south aboard the steamship Alameda. Captain J. Levingston and part of the crew remained aboard the vessel. Besides a heavy cargo there was a large quantity of mail aboard, which is believed to have been ruined by water. The vessel was valued at \$500,000.

Roy V. Crowder, passenger traffic manager of the Los Angeles Steamship Company, who returned late last month from a five weeks' tour of the Hawaiian Islands, accompanied by S. P. Trood, advertising manager, states that the Hawaiian Islands will be the Mecca for the large

est influx of visitors in 1928 in the history of the mid-Pacific isles. Crowder said that hotel and restaurant operators, pleasure resorts and other agencies catering to the tourist trade in the Islands are highly optimistic over the business to the Islands during 1927, and have made plans for a much larger influx of visitors this year.

Chief Engineer R. C. Dwyer of the liner Malolo states that the vessel is the finest ship sailing the seas. Formerly first assistant engineer of the United States liner Leviathan, Chief Dwyer has been constantly kept on the job since the arrival of the Malolo on the Pacific Coast for the Hawaiian run. Chief Dwyer states that the run between San Francisco and Honolulu is the finest that he has ever sailed, and that he plans to select a home in the transbay district or Honolulu within a few months.

The following are the other members of the engineering staff of the Malolo, all of whom are well known in the engineering fraternity of the Pacific Coast:

First Assistant, H. T. Keene; Senior, Charles T. McFeely; Second Assistant, Lloyd Kennedy; Junior Second, J. F. Murphy; Third Assistant Engineers, T. J. Kinslow, Ralph T. Hart, H. A. Woodruff; and H. D. Jefferson, electrical engineer.

Navigating officers of the Malolo are: Commander, Captain C. A. Berndtson; Executive Officer, Captain A. G. Townsend; First Officer, H. C. Dwyer; Second Officer, T. K. Whitelaw. Senior Third Officer, Charles Porta; Junior Third Officers, A. E. Severin, W. M. Johnson, and H. R. Baldwin.

Purchase recently of 250 feet of frontage on the Seattle waterfront at the price of \$100,000 was carried out by the Chicago, Milwaukee and St. Paul railway for the purpose of erecting three oil tanks of a 500,000 gallon capacity for the storage of vegetable oils brought in by Japanese steamers.

By the end of January, seventeen vessels of the Yamashita fleet will have moved more than 35,000,000 feet of lumber, besides heavy consignments of wheat and general cargo out of the Pacific Northwest since the middle of last December. The cargoes went to various Oriental ports. This is a record volume of business for a Japanese line.

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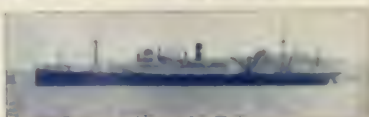
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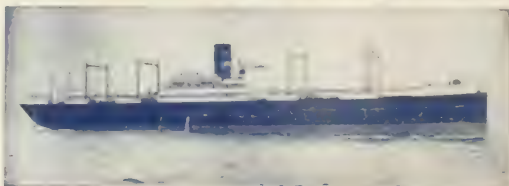
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Hundreds of engineering friends and other maritime officials learned with regret of the passing of John Maynard, who for many years was marine engineer for the Nelson Line ship Marsodak. Mr. Maynard passed away while visiting St. Helena, Oregon, and burial took place in Wilmington. He is survived by his widow and two daughters, who reside in Lomita.

W. A. Finney, dock superintendent for the California & Eastern Steamship Company at Los Angeles Harbor, has returned from a visit to his daughter in Dodge City, Kansas.

During the month of November 1927, the port of San Francisco led all Pacific Coast ports in the number of accidents on wharf and ship, according to a report of Warren H. Pillsbury, deputy commissioner, United States Employees' Compensation Committee. During this period San Francisco's accidents totaled 97, with Los Angeles harbor a close second with 85 accidents. Injuries reported at other ports were: San Diego, 4; Hawaii, 19; Alameda, 2; Oakland, 27.

Los Angeles Harbor officials are making fast strides in the removal of Deadman's Island at the entrance to the harbor. The work is being performed by the San Francisco Bridge Company. During the operations of removal, Thomas F. Etipp of the California Academy of Science, has been conducting research work on the strata of the island for his historical fossils.

San Francisco friends of James Gaston, former marine engineer with various steamship lines, were shocked to learn of his death last month in Galveston. Mr. Gaston, for several years until his passing, was marine engineer for the United



Captain F. E. Anderson and Chief Officer J. H. Benson of the Dollar liner President Wilson.

States Shipping Board, with headquarters in Galveston, Texas.

Daulton Mann, general manager of the Panama Mail Line, returned to San Francisco late last month, after a seven weeks' tour of the offices and agencies of the line in the Spanish Americas. Mr. Mann was highly optimistic over trade conditions in all ports of Latin America. He was accompanied on the trip by Mrs. Mann.

The Todd Dry Docks, Inc., Seattle, is now engaged in converting the Comfort, a former United States naval hospital ship, into a modern passenger liner for the Ward Line of New York. The job represents a



Commodore J. C. Holland of the Panama Mail Line, master of the motorship City of Panama.

cost of \$800,000, and is one of the largest remodeling contracts carried out during last year.

Los Angeles marine advices report that negotiations for the purchase by the Western Oil & Refining Company of two tankers was virtually completed on the East Coast by Richard Florian, president.

A. A. G. Scherbell, secretary of the company, said that the Western Oil & Refining Company also plans construction of a fleet of tankers for foreign service. He said that a large loading dock would also be constructed at Los Angeles Harbor on the west basin near its refinery. A base has been established at Oleum to serve the San Francisco Bay district.

The Standard Oil Company of California will have within the year two of the world's largest diesel-driven tankers, according to an announcement made by John C. Cronin, chief engineer of the company. He said that the construction of the first of the ships has begun at Kiel, Germany, and this boat is scheduled for delivery in August of this year, to replace the oil carrier District of Columbia.

Each of the craft is 526 feet long and more than 67 feet in beam. They will be driven by twin screws, and will have twin engines of 2000 horsepower each.

The Harbor Tug and Barge Company, formerly located at the foot of Franklin Street, Oakland, has moved into new quarters at the foot of Grand Street, Alameda. The company recently leased the site at a monthly rental of \$200. Improvements consisting of steel warehouses and docks are now under way. The move was made so that the 38 tugs operated by the company will be more centrally located for inner harbor operations.

The freighter Seekonk is now en route to the Pacific Coast following its sale by the Seekonk Corporation to the Alaska Packers Association. The sale was made through William Cramp & Sons of Philadelphia, and is the third steamer to be acquired by the Alaska Packers within the past two years. The company is gradually discarding sailing vessels in favor of steamers, principally because a steamer can carry more cargo and can make three trips to a sailing vessel's one. Also

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the steamer can be used the year around. Several of the fishing companies in northern waters have recently acquired steamers and the Alaska Packers were forced to take similar action to meet competition.

Roger D. Lapham, president of the American-Hawaiian Steamship Company, which is one of the largest steamship companies operating in the intercoastal trade, spoke before the members of the Pacific Traffic Association. He pointed out coast trade conditions and used for his subject "The Menace of the Industrial Carrier to the Intercoastal Trade." Shipping officials declared that Mr. Lapham's address was one of the finest and most illuminating talk on this subject that the Pacific Traffic Association has ever had the pleasure of listening to.

Captain Paul Grening, well known in Pacific Coast shipping circles, and formerly master of the liner President Harding, is now directing United States Shipping Board activities for the Merchant Fleet corporation, as European director. He succeeded Joseph E. Sheedy. Confirmation of Captain Grening's appointment was made by the Board in Washington. Since last May, Captain Grening has been Acting European director for the Merchant Fleet Corporation.

Walter Green, formerly chief officer of the Panama Mail liner Colombia, and now an official of the Banning Stevedoring Company at Los Angeles Harbor, is spending several weeks at his Alameda home with his family.

Chief Engineer Wilbur C. Edwards of the steamer Rose City, carver of ships, is busy again on another model that he hopes will out- rival in beauty and design his model of the Santa Maria.

John P. Lawlor has resigned from the freighter Pacific Pine, and is now visiting the East Coast. He was succeeded by William Bunting. Both are widely known in Pacific Coast maritime circles.

William F. Hagberg, first assistant engineer of the steamer District of Columbia, is now convalescent, following an illness at the Marine Hospital, San Francisco.

Chief Engineer William J. Moon-ey of the steam schooner H. W. Baxter is spending several weeks



Roger D. Lapham, president of the American-Hawaiian Steamship Company.

vacation in the South. While shore-side his berth is being filled by James M. Liston.

Starting January 1, and continuing until March 31, new low rates for the three months will go into effect by the Los Angeles Steamship Company, according to Roy V. Crowder, passenger traffic manager. The new rates will be \$17.50 for the round voyage between San Francisco and Los Angeles and \$23.50 between San Francisco and San Diego.

William J. Gunn, formerly second assistant, has been promoted to first assistant of the West Calera by Chief Engineer Herbert T. Berger.

Albert J. Higgins, formerly chief engineer of the Dollar freighter Stuart Dollar, was appointed to the same position on the President Gar-



W. W. Bowers, first assistant engineer, Panama Mail liner Colombia

field. He replaced Chief Engineer William D. Schoning, who is remaining shore side.

Well-Known Westinghouse Man Dies

COLONEL GRANT GREEN, head of the Visitors' Bureau, Westinghouse Electric and Manufacturing Company, died in the Wilksburg Private Hospital on Thursday, November 24, 1927.

Colonel Green was one of the most picturesque figures connected with the Westinghouse company. He served 22 years in the United States Navy, holding positions of Warrant Machinist, Chief Yeoman, and Secretary of Admiral Sampson in charge of the fleet. He fought in the battle of Santiago (Spanish-American War) where he was stationed on the flagship New York, the Philippine Insurrection of 1899, and the Boxer Uprising in China in 1900.

The extensive travels of Colonel Green carried him around the world four times. He visited almost every country of the globe and made many friends abroad. While he was in charge of the Visitors' Bureau, he welcomed many prominent personages to Westinghouse, and often renewed acquaintances with people whom he had met on his travels.

Lloyd's Register of Shipping has published a new set of Rules for the Building and Classification of Composite and Steel Yachts of the Cruising Type.

These rules have been in the course of preparation for the past several years and take precedence over all formerly published yacht rules. It is almost fifty years since the Committee of Lloyd's Register published scantling rules and tables for yachts, and they are the only published yacht rules.

A similar revision was made a short time ago in connection with the Rules for the Building and Classification of Wood Yachts, and these have been found of very great assistance to yachtmen, yacht builders, designers, and repairers in connection with the building and repairing of this type of vessel.

It is anticipated that there will be a very great demand for the new Steel Rules, and copies of these can be had from the Society's office at 17 Battery Place, New York City, at the cost of \$7.50.

These publications also include the Society's Rules for internal combustion engines, diesel engines, steam engines, and electric fittings.



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RCA

MARINE RADIO

Freights, Charters, Sales

December 16, 1927.

THE following steamers are reported fixed with grain from the North Pacific to the U.K.-Continent: British str. Pilar de Larrinaga, Mediterranean, 33/6, prompt, Continental Grain Company; Japanese str. Washington Maru, U.K.-Continent, Nov.; Japanese str. Yeifuku Maru, same, Nov.; British str. Zurichmoor, same, Nov., Heatley & Co.; British str. Sheaf Mount, Antwerp or Rotterdam, 32/-, Hamburg 32/6, Dec.; Japanese str. San Francisco Maru, U.K.-Continent, Dec.; British str. Trevanian, same, Earl Stoddard & Clayton; a steamer, same, Feb.; British str. Dalemoor, same, 31/9, Jan.; British str. Rugby, same, Dec./Jan.; a steamer, Rotterdam, 30/6, Dec., Continental Grain Co.; Japanese str. Ohio Maru, U. K.-Continent, 31/7½, Jan., Wm. H. Pim, Jr.; Japanese str. Taibu Maru, same, Dec.; a steamer, Antwerp or Rotterdam, 30/6, February, Wm. H. Pim, Jr.; British str. Turkestan, Antwerp or Rotterdam, 30/6, Hamburg 31/3, January, same charterers; Japanese str., U. K.-Continent, 32/-, Antwerp or Rotterdam, 31/9, Dec.; British str. Holmpark, U. K.-Continent, 32/-, Antwerp or Rotterdam, 31/9, Jan.; Smith steamer, U. K.-Continent, 32/-, Antwerp or Rotterdam, 31/9, January; (Common str.) Antwerp/Rotterdam, 30/6, option Hamburg 31/-, Feb., Wm. H. Pim, Jr.; (Common str.), same, Feb., Heatley & Co.; British str. Falls City, U.K.-Continent, Jan., Ed. L. Eyre & Co.; Swedish m.s. Oxelosund, U. K.-Continent, Jan., Heatley & Co.; Swedish str. Sagoland, Antwerp or Rotterdam, 30/6, if Hamburg 31/-, Feb., Canadian Cooperative Wheat Producers Assn.; British str. Welsh City, U. K.-Continent, Jan.; a Smith str., U. K.-Continent, 32/-, Antwerp or Rotterdam, 31/6, Feb.; Swedish str. Sydland, Antwerp or Rotterdam, 31/-, option Hamburg, 31/6, Dec.; British str. Diaden, U. K.-Continent, Dec., Strauss & Co.; British str. Kensington Court, U. K.-Continent, Dec., same charterers; Br. m.s. Westmoor, same, 32/9, Feb., Balfour Guthrie & Company; British str. Rockpool, same, Dec.-Jan.

The Japanese str. Fukuyo Maru is reported fixed from Columbia River to Australia, Nov. loading, by Pacific Export Lumber Co., and

the British m.s. Glenbank, same, 15½, Dec., J. J. Moore & Co., Inc.

The following fixtures are reported for lumber to the Orient: Japanese str. Malta Maru, Japan, Nov., Yamacho & Company; Japanese str. Koki Maru, two ports Japan, Nov., Douglas Fir E. & E. Co.; Japanese str. Ypres Maru, Shanghai, Nov., Dant & Russell; Japanese str. Erie Maru, Yokohama and Osaka, Canadian American Shipping Co.; Japanese str. Johgu Maru, same, Dec., same charterers; Japanese str. Atsuta Maru No. 6, Yokohama and Kobe, Dec., same charterers.

The American str. Edna Christenson is reported fixed from Puget Sound to Balboa with lumber, \$12, Nov. loading, W. R. Grace & Co., and the American str. Tillamook, from Eureka to La Union and San Jose de Guatemala, redwood, Hammond Lumber Co.

The following fixtures are reported for lumber to the Atlantic: American str. Henry D. Whiton, Portland to New York, \$12, R. R. Sizer & Co.; American str. Agwistar, Columbia River and Puget Sound to North of Hatteras, \$12, Dec., Brady-Ketcham Lumber Co.

The following steamers are re-

ported fixed with lumber to South Africa: British m.s. Myrtlebank, Puget Sound to South Africa, Feb., East Asiatic Co.; a Yamashita str., British Columbia to Capetown, Delagoa Bay, Jan.; Japanese str. Gyokoh Maru, British Columbia to South Africa, Jan., J. J. Moore & Co.

The Japanese str. Taiyu Maru is reported fixed from San Marcos Islands to China, gypsum rock, Dec., Standard Gypsum Co., Inc.; Norwegian m.s. Fernlane, Puget Sound to Rotterdam, lumber and general merchandise, Jan., Canadian American Shipping Co.

The Swedish m.s. Strassa is reported fixed on time charter, with delivery Colon, redelivery North of Hatteras, \$137½, H. R. Mac-Millan Export Co.

The following sales are reported: American str. C. H. Lawrence, Jr., \$16,000, U. S. Marshal to Security Trust Bank of Maryland; American ship St. Paul (to be converted to barge), Booth Fisheries Company of Chicago to Pacific Cement Co.; American str. Grace Dollar, Dollar S.S. Co. to Japanese parties.

PAGE BROTHERS, Brokers.

Fairbanks-Morse Diesel on Puget Sound Freighter

ONE of the interesting freighters powered with Fairbanks-Morse diesels is the Seatac, which is now operating on a run on Puget Sound between Seattle and Tacoma. G. E. Craig, manager of the marine department of Fairbanks Morse & Co., at Seattle, who sent in the information, states that the Seatac was designed by Captain Fred H. Marvin of the Merchants Transportation Company, owners of the boat. This company already operates a fleet of three other freighters on Puget Sound waters, the D. P. Handy, Marvin, and Starrett.

The arrangement of the Seatac provides a maximum of cargo space, with provision being made for the comfortable accommodation of the officers and crew, which totals eighteen men. Aft the wheel house, the view is unobstructed, the cabins and staterooms being arranged in the main deck house below the bridge and forward of

the engine room hatch, aft of which is the roomy galley with Shipmate range, and the mess room.

On the maindeck aft of the cargo space are quarters for four of the men, with a well lighted reading room. Cargo space on the main deck is approximately 20,000 cubic feet while there is additional space forward. An interesting feature is the Barlow marine elevator for handling cargo, which is installed forward. This apparatus enables stevedores to wheel cargo on or off the vessel on pier floor level irrespective of tidal conditions.

The Seatac is equipped with a 180-horsepower Fairbanks-Morse full diesel engine which gives her a speed of 9.2 miles an hour.

The vessel is extra heavily constructed throughout. The keel is 14-inch fir, the main keelson 14 by 18-inch, with sister keelsons 12 by 22 inches. The planking is 2¾-inch with ironbark reinforcements. The frames are 5½ by 11 inches, spaced on 16-inch centers.

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—Lord Dunsany, *The Gods of Pegana* (London: George Allen & Unwin, 1915).

San Diego from Los Angeles

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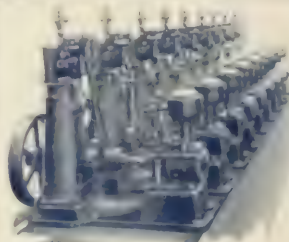
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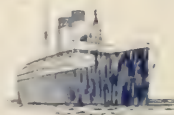
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Shipping and Foreign Trade

(Continued from Page 29)

practically helpless in that respect and had to spend more than three billions of dollars, imposing a permanent interest burden of \$120,000,000 per year on our people, in a frantic attempt to build an emergency fleet; while the effect of Japan's business-like legislation was to give her that magnificent merchant marine, which is one of the world's important carriers today.

Foreign Trade Growth

Thus it was that before the World War, in spite of the tremendous wealth and unlimited producing powers of this country, both England and Germany surpassed us in the volume of their foreign trade; but since the World War forced upon us an American Merchant Marine, we have developed a foreign trade of practically 10 billions of dollars; and it is to be noted that the mere increase in our foreign trade during the five years we have had American ships serving us in that trade is almost equal to the entire foreign trade which we were able to build up during the previous fifty years, when we were depending so largely upon foreign ships. A most important fact to remember when considering this great growth in our exports, which has come since we had American ships, is the tremendous increase in the volume of our manufactured products now being sold abroad; for manufactured products are practically all labor; and such exports bring to people in the United States a corresponding increase in opportunities for employment.

Here is where we must take our hats off to our brainy

neighbor, Canada. In addition to the preferential duties which have done so much for her interests, we find that only last September, the Board of Railway Commissioners for Canada, a body corresponding to our Interstate Commerce Commission, authorized the government railways to haul grain from Buffalo to Halifax and St. John, a distance of 1183 miles, for the same pay that American roads receive for hauling grain from Buffalo to New York, a distance of 397 miles. Of course, this difficult winter-hauling of grain way up around the top of Maine, so as to keep the traffic in Canadian territory while delivering to Canadian ports, is done at an apparent loss; but Canada knows that the money thus spent goes to the Canadian citizens who handle that traffic; that their own transportation facilities are thus employed and developed; that the ports of Halifax and St. John are immensely benefited thereby; while the bulk of cargoes landed there naturally falls to British vessels, for Americans run no ships from Canadian ports. Imagine us having the sand to do a thing like that!

While we are preparing, and rightly, to spend millions upon millions of dollars for the construction of war ships to protect our foreign trade in case it is ever attacked sometime in the future, would it not be wise to spend a few million on our merchant ships to protect us against the commercial attacks which are being made on that same trade right now?

Italian Subsidy System

(Continued from Page 6)

Scope of the Subsidy System

The Italian system rests on definite conceptions of the relations of a Government to its citizens, which to a greater or less extent have long been recognized by civilized nations. It is instructive because it expresses certain of those relations more clearly and comprehensively than they are usually expressed in maritime legislation. The Mussolini system is a positive assertion of two principles in navigation; first, the obligation of the state to provide, in its own behalf, means of transport by water for its citizens; second, the power of the state to require of its citizens the discharge of that obligation. To the government of Italy the waters surrounding the peninsula, the islands, and the colonies are the medium of communication between Italian citizens, and a transport system has been devised having such use of that medium as its main purpose. The subsidized lines serve on the water the purposes which the old Roman highways served on land. Of course, Italy, like England, France, Spain, and other colonizing powers, has employed before subsidies as the means of binding to the mother country sons who cross the sea, but the Italian contracts of 1926 declare that end "indispensable" and bristle with requirements to make them effective.

The subsidy system is to serve Italian citizens in their relations to the Italian State, to assure their transportation under their own flag between the vari-

ous ports of the peninsula, the islands, and the colonies of Italy for purposes of mobilization and the range of military duties, for attendance as members at the session of Parliament, for the discharge of official duties as officers or employees of the Government, as invalids of the wars in recognition of previous military services, and finally to enable Italians to be present at elections and at national anniversaries and celebrations. The system also assures like transportation to Italians for purposes which are regarded as national, such as attendance at the national universities and schools of fine arts, at expositions, congresses and fairs, and on scientific expeditions and as religious missionaries to the colonies and non-Italian regions. All the subsidy contracts contain special requirements for the accomplishment of these purposes.

The protection of Italians while so transported is undertaken through the requirement that the subsidized ships shall be constructed to be capable of carrying six inch guns for defense and shall carry an extra captain and chief engineer so as to be at all times under command of qualified Italians. The personnel of the officers and crews of the subsidized ships must be approved by the government and the principal representatives of the subsidized companies in foreign ports must be Italian citizens, unless the government permits exceptions. Sixty per cent of the stock of the companies must at all times be owned by Italians. The subsidized

Pacific Marine Review

The National Magazine

of Shipping

February, 1928

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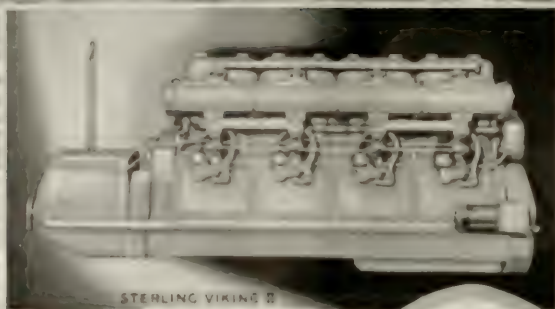
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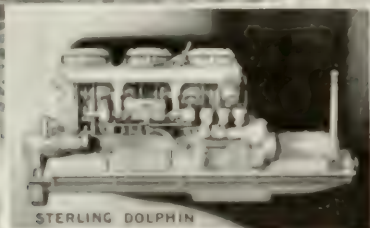


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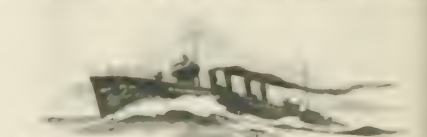
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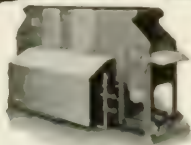
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Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship
Association

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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of the Pacific

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Latest "Credit Maritime"

THE United States is not alone just now in depression among shipbuilders. France is greatly troubled at the state of the yards along her coasts. It is claimed that French shipbuilding costs for an ordinary cargo vessel are 15 to 30 per cent higher than those of Great Britain, as judged by figures on recent contracts.

The shipbuilders of France have for several years been asking for a resumption of the direct subsidies on premiums which they were enjoying prior to 1918. The government has been proposing exemption from customs duties on shipbuilding materials. Loans to shipbuilders at low rate of interest under a scheme known as the "Credit Maritime" have been discussed for the past five years, and it now appears that a new scheme along this line, prepared by the Minister for Public Works, has a very good chance of becoming law.

In this new scheme a billion francs is to be set aside, at the rate of 200 million a year, and loaned out to shipowners for building new tonnage. Loans to be up to one-half the value of ship property under the mortgage. Any ships owned by the borrowing owner to be good for security. Loans to be paid back in twenty years, 4 per cent interest. It is figured that this kind of assistance may represent a subsidy as high as 10 per cent.

From October 27, 1926, to October 27, 1927, not a single shipyard in France booked an order for a vessel of medium or large tonnage. Since the latter date one or two larger orders have been placed, and there is a program of four passenger liners to be built in the near future.

The Year in Transportation

Marked advancement in transportation in the air and on land are revealed in a brief survey of the progress made in 1927 by A. B. Barber, manager of the Department of Transportation of the Chamber of Commerce of the United States.

"We have made the most striking progress in the air," said Colonel Barber. "We now have a good federal aeronautics law. Air lines and landing fields are being laid out. Municipalities are establishing well-equipped air ports. Private operators are providing excellent service. What is needed most is an appreciation on the part of business concerns and the general public of the advantages offered by air mail and express.

Under a sound national policy embodied in the Transportation Act the railroads have been enabled to expend \$900,000,000 a year since 1923 in improvement

of equipment and facilities, with extraordinary improvement in service. Slight changes in the Act are needed to facilitate consolidation. Waterways are being developed to give connected commercially useable channels and a beginning is being made in rail-water cooperation.

In the field of highway transportation we have also gone rapidly forward. The federal system of highways is being rounded out and the problem of highway traffic regulation is being taken up generally.

On the seas alone we are lagging. Our merchant marine policy is sadly lacking. American shipping must be placed on a competitive basis with foreign shipping and should be endowed with the vitality and initiative that comes only with private enterprise."

Hands Across the Pacific

Further evidence that the Pacific region is looking to the westward rather than to the east is afforded by the announcement that the Occident and the Orient will be brought together at the midyear meeting of the Western Division of the Chamber of Commerce of the United States at Honolulu, February 8 and 9.

Business men from the western section of the United States will leave on three ships from San Francisco, Los Angeles and Portland. From the Far East,—or to the Pacific Coast, the Far West,—will come a number of Chinese business men. Australia, New Zealand, and Canada will also probably be represented.

The theme of the meeting will be the New Pacific.

A Sand Fog at Sea

"A gale from the north began December 3, 1927. Reports received from friends traveling across the Santa Ana plains country, state that the sand was so dense that it was impossible to continue driving. Drifts filled the highways and autos were driven through with difficulty. This ship was moored at Berth 60, Outer Harbor, San Pedro. It was necessary to double up all mooring lines. Sand blowing in from the vicinity of Santa Ana began to fill the atmosphere, continuing all night; next morning this vessel put to sea. The atmosphere was so full of sand that the ships of the Pacific fleet were hardly discernible at a distance of ¼ mile. It was impossible to use semaphore or flag hoists. We steamed to Santa Catalina Islands and the conditions remained the same. The ship was covered with dust and clothing was covered as if one had been driving in the country. Our eyes and throats became filled with dust. The dust was claylike and moisture caused it to stick wherever it lay."—(U. S. Hydrographic Bulletin.)

Captain Amos Nicholas Jr. commanded the bark Herbert Black and the ship Governor Robie.

Captain William H. Goodell commanded the barks Goodell and Robert Porter and the ship Governor Robie.

Captain Albert G. Closson never sailed in square rigged vessels but was master of several large schooners.

Captain James B. Parse was chief mate of several ships and subsequently commanded the Virginian, Texan, and other steamers of the American-Hawaiian fleet. His last position was surveyor at New York for the North American Insurance Company.

Captain Henry G. Curtis commanded the ships Hope, John C. Potter, State of Maine, and Belle of Bath. In August 1882, Captain Curtis left Puget Sound in the ship Hope with a cargo of lumber for Valparaiso. On September 12, when in latitude 18 North, the ship was practically dismasted, losing fore and main masts with everything attached. The ship made no water and Captain Curtis set up a jury rig. One month after the disaster he reached Honolulu, having sailed 2100 miles. Captain Curtis arrived at San Francisco, accompanied by his wife, who had been with him on the Hope, on the steamer Suez. The Hope was condemned and sold but was repaired, and, rigged as a bark, made many subsequent voyages across the Pacific with lumber.

Captain Clarence N. Meyers was master of several schooners, the brig H. H. Wright, barks Mabel I. Meyers, and Adam W. Spies, and the ship Thomas Dana. The Adam W. Spies was at Newcastle, New South Wales, in December 1888, loading coal for Hong Kong and was the loftiest of a fleet of 151 vessels in port, although her tonnage was only 1170. She made the run to Hong Kong in the very fast time of 31 days.

Captain Isaac Carver was chief mate of several ships and later commanded government colliers in both the Atlantic and Pacific Oceans. He was also master of oil tankers operating in the Atlantic.

Captain William R. Gilkey commanded several brigs and schooners.

Captain Nathan F. Gilkey was master of several schooners and of the bark C. P. Dixon. Later he traded to the River Plate in the iron ships Rhine and Timandra, which had been purchased from English owners by N. W. Rice & Co. of Boston. During the World War he commanded the steamer Bethnor.

Captain Charles M. Nichols was born in Searsport in January 1851, and went to sea at the age of sixteen. In 1874 he took command of the bark Patmos, and in 1882 the ship Henrietta. Later he was master of the ships S. F. Hersey, Lucy A. Nickels, and A. J. Fuller. Following the sale of the latter, he took command of the Hawaiian, one of the first steamers of the American-Hawaiian fleet and continued in that employ in various steamers until his retirement from sea life in 1916. The bark Patmos was burned off Cape Horn while bound from Hull to Valparaiso with coal. Captain Nichols and his crew were picked up out of their boats by a Liverpool ship bound to Valparaiso. For several days after the rescue the weather was very bad, with no observations being possible. The ship was then found to be on a dead lee shore about a hundred miles south of the entrance to the Strait of Magellan, with a hard gale blowing. There was every prospect of the ship going ashore, as she would have surely done had anything carried away. The English captain lost his nerve and voluntarily gave Captain Nichols complete command. The latter with his double crew was able to act quickly and extricated the ship from her precarious condition, so that she completed her voyage in safety.

In January 1900, the ship A. J. Fuller, Captain Nichols in command, was running her easting down in the Southern Indian Ocean, bound to Japan from Philadelphia. The latitude was about 47 degrees, ship making about eleven knots under three skysails in a strong northerly breeze, thick weather, but quite smooth sea. A man fell overboard from the jibboom. As he passed aft, Captain Nichols threw him a life buoy from the wheel-house rack, called all hands, reduced sail as soon

(Continued on Page 41, Advertising Section)



A group of Searsport ship masters assembled as the guests of Wingate F. Cram, president of the Bangor-Aristook Railroad, on the 12th of August, 1927.

The hatless gentleman, sitting on the front step is Mr. Cram. The others are:

Top row, left to right: Captains Amos Nichols, Andrew Ross, Phineas B. Blanchard, W. R. Gilkey, Nathan Gilkey, Wm. Goodall.

Second row, left to right: Captains Isaac Carver, Daniel C. Nichols, Albert N. Blanchard, James Paree, Charles M. Nichols.

Bottom row: Captain Albert Clawson, Joseph Sweetser, Edward Mears, B. C. Colcord, Henry Curtis.

Note: Since article was printed it appears that there are twelve Searsport Captains still alive who are not shown in the picture. Those not mentioned are Captain Oscar G. Euton, a marine surveyor of Boston; Captain Harry Dow, now commander of a Luckenbach steamer; and Captain Frank P. Whittier, retired, of Portland, Maine.

ing in foreign yards, then unquestionably a number, if not substantially all, of the services now being operated by the Shipping Board can be sold and the government retired from the business altogether.

There may be some services in which the handicaps of higher costs of construction and operation cannot be overcome by any reasonable means. If, under these conditions, the Shipping Board finds that it cannot sell such services, it will be highly questionable whether the services should be continued. Certainly in those instances the Shipping Board should make a most searching survey into the causes which make the services so unprofitable, and if there is no reasonable prospect of a particular service being made self-sustaining, then unless there are other reasons than commercial, such as national defense, to justify its continuance, the service should be ended.

The shippers also recommended to the Board that the

government should not only get out of the shipping business, but it should also retire from the operation of Army and Navy transports, whenever, in the judgment of the President, adequate transportation facilities are afforded by privately owned vessels. They endorsed the bill sponsored by Senator Jones (S 1608), which is designed to meet this situation.

Pacific owners and operators made it very emphatic that there is no desire on their part to effect the repeal of the La Follette Seaman's Act. There has been what is termed a mistaken impression that American shipowners generally want that law stricken from the statute books or at least parts of it. Nothing could be further from the truth, the shipping men say, but they do ask that a few minor changes be made in the Act which they claim will not affect the standards of living or the wages of the seamen.

(Continue on Page 41, Advertising Section)

American Merchant Marine in Foreign Trade

American Shipowning Organizations Present to the Shipping Board
Conference Some Sane, Common-sense Recommendations for a
Legislative Program to Put American Shipping on a
Permanent Basis in Foreign Trade

IN its major phases the problem of placing American shipping in foreign trade on a permanent basis involves the following general considerations:

- (1) Replacement of Obsolete and Worn Out Ships.
- (2) Meeting the Differentials in Operating Costs.
- (3) Retirement of the Government from the Shipping Business.
- (4) Amendment of the Navigation Laws to Make Them No More Burdensome Than the Laws of Other Maritime Countries.

These proposals cover the principal obstacles which must be surmounted if we are to have a successful, permanent American merchant marine. To meet and overcome them the American Steamship Owners' Association, the Pacific American Steamship Association, and the Shipowners' Association of the Pacific Coast make the specific recommendations hereinafter set forth.

There are many other and less important matters concerned in this great problem which merit attention, but it has seemed wise to forego their discussion at this hearing so as not to detract from the essential things that must be done by Congress, if we are to have a merchant marine commensurate with the needs of national defense and justified by our position in world trade.

At the outset, however, we desire to make clear our firm conviction

COMPARATIVE STATEMENT.
WAGES, NUMBER OF CREW, AND SUBSISTENCE—AMERICAN VESSELS AS COMPARED WITH
VESSELS OF NORWAY, GREAT BRITAIN, ITALY, FRANCE, AND JAPAN.

	U S	U S	Norway	Great Britain	Italy	France	Japan
Trade Route	West Coast P. C.	W. C. S. S. A.	Transp.	Italy	Australia	Europe	Transp.
Type of Vessel	Cargo	Cargo	Freight	Cargo	Freight	Freight	Cargo
Propulsion	Coal	Oil	Steam	Coal	Steam	Steam	Coal
Tonnage	Net	Net	Net	Net	Net	Net	Net
Gross	Net	Net	Net	Net	Net	Net	Net
D W T	Net	Net	Net	Net	Net	Net	Net
	No.	No.	No.	No.	No.	No.	No.
	Wages	Wages	Wages	Wages	Wages	Wages	Wages
DECK DEPARTMENT							
Master	1 \$290.00	1 \$290.00	1 \$240.00	1 \$170.17	1 \$72.45	1 \$91.91	1 \$98.00
1st Mate	1 185.00	1 185.00	1 126.66	1 104.44	1 57.96	1 74.67	1 63.70
2nd Mate	1 165.00	1 165.00	1 113.33	1 84.00	1 49.68	1 57.44	1 46.55
3rd Mate	1 150.00	1 150.00	1 100.00	1 61.15	1 43.47	1 40.14	1 41.65
4th Mate	1 80.00	1 80.00	1 66.66	1 60.75	1 25.88	1 16.98	1 25.48
Carpenter	1 75.00	1 75.00	1 66.66	1 55.99	1 16.98	1 27.93	1 27.93
Boys	8 500.00	8 500.00	4 212.22	5 243.00	8 165.60	8 63.92	8 38.54
Ordinary Seamen	2 95.00	2 95.00	4 160.00	2 92.34	1 67.91	1 22.98	1 51.45
Radio	1 105.00	1 105.00				4 99.16	4 99.16
Quartermaster						1 5.66	
Cabin Boy			3 79.99		4 49.68	1 5.66	1 11.70
Deck Boy							
Boy							
Apprentice							
ENGINE DEPARTMENT							
Chief Engineer	1 260.00	1 260.00	1 146.66	1 114.07	1 72.45	1 65.93	1 86.20
1st Asst	1 185.00	1 185.00	1 120.00	1 104.44	1 57.96	1 41.12	1 49.00
2nd Asst	1 165.00	1 165.00	1 100.00	1 77.76	1 49.68	1 31.07	1 41.65
3rd Asst	1 150.00	1 150.00		1 61.15	1 43.47	1 31.17	1 31.85
Deck Engineer				1 55.99			
Oilers	3 217.50	3 217.50	4 326.64	3 115.51	6 131.84	4 67.42	4 94.08
Foremen	4 607.50	4 607.50	4 213.32	9 429.57	6 197.46	13 207.74	6 135.24
Coal Passers	3 180.00						
Wipers		2 115.00	3 139.98				
STEWARDS DEPARTMENT							
Chief Steward	1 130.00	1 130.00	1 91.33	1 70.47	1 21.32	1 14.65	1 26.95
Steward	1 165.00	1 165.00	1 66.66	1 65.61	1 21.36	1 21.98	1 22.05
Chief Cook	1 100.00	1 100.00	1 66.66	1 65.61	1 21.36	2 33.96	
2nd Cook-Baker	1 80.00	1 80.00	1 46.66	2 41.31	3 27.26		2 41.16
Mess Boys	3 126.00	3 126.00	1 56.66				
Total	42 \$1,816.00	35 \$2,158.90	35 \$2,246.52	35 \$2,117.54	42 \$1,140.99	45 \$501.29	34 \$1,065.58
Subsistence Per Mo	519.00	682.50	420.00	724.88	441.00	472.00	306.00
Total	\$4,655.00	\$4,041.00	\$2,766.52	\$2,842.42	\$1,581.99	\$1,425.29	\$1,171.54
Subsistence Per Man Per Day	65	65	40	54 1/2	35	32	30

Compiled by the American Steamship Owners' Association from statements received from the United States Shipping Board November 14 and 22, 1927

that permanent increase in government ownership of ships will be, but would permit construction with funds from such sale through the government, construction of shipping companies and that the government would not be prevented from constructing new ships until the cost of government ownership of the ships building at present.

Replacement of Obsolete and Worn Out Ships

The bill of H. R. 10000, which is the basis of the new shipping law, provides for the replacement of ships which are obsolete or worn out. The bill provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out.

One of the main reasons for the passage of this bill is that the government has been unable to replace its ships which are obsolete or worn out. The bill provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out.

The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out.

These differentials in costs can be met only in one of two ways: (a) through the government absorbing the difference, or (b) through increased earnings of American ships as compared with foreign ships.

The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out.

There are changes which could well be made in the bill, but they do not concern its fundamental principles, except that the associations believe that the bill should be amended to provide for the construction of new ships in the United States and to provide not restricted to definite termini.

One of the most important factors, and a growing factor, in American foreign trade is the transportation of petroleum products. Furthermore, there is no class of ships more needed for national defense than oil tankers. It is a certainty that no oil tankers will be built in the United States for foreign trade unless the

government is able to subsidize the construction of such ships. It is to be hoped that the bill will provide for the construction of such ships.

The Shipping Board, however, feel that the passage of the bill would be a step in the right direction. They feel that the bill should be amended to provide for the construction of such ships. They feel that the bill should be amended to provide for the construction of such ships.

The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out. The bill also provides that the government shall have the right to purchase ships which are obsolete or worn out.

If the bill is passed together with that heretofore mentioned, it will solve the problem of the construction of new ships. It will contribute to the permanence of our shipping.

Differentials in Operating Costs

Due to the higher standards of wages and sustenance of crews and the larger personnel required by law on American ships, as compared with similar requirements on foreign ships, and in some cases to the burden of the duty on repairs made abroad, there are unquestioned differentials in the costs of operation of American ships.

Statistics compiled from statements recently received from the United States Shipping Board show that the monthly cost of wages and sustenance on an oil tanker, 10,000 deadweight, American ship, is \$1000.00, on a similar ship, 8,000 deadweight, American ship, is \$900.00, on a similar ship, 8,000 deadweight, British ship, is \$1581.99, on an Italian ship, is \$1425.29, on a French ship, is \$1371.58, on a Japanese ship, is \$2766.62, on a somewhat smaller, 6000-ton, deadweight, Norwegian ship.

The larger costs of operating American ships must be paid out of earnings, and obviously this can only be done if the earnings of the American ships are greater than those of competing foreign ships. Unless earnings are had to meet the higher costs, the ships cannot be operated.

These higher costs have already been offset in some of the so-called essential services sold by the Shipping Board, through reduction in capital costs, and thus in the fixed charges of insurance, depreciation and interest. But this means of meeting the differentials is only temporary, and will offer no permanent relief in the operation of new ships which will hereafter replace the low priced ships sold by the government.

The differentials exist even in the case of some of the ships already sold by the government at low prices, due primarily to the fact that competition prevents American ships from obtaining full cargoes, or to the prevalence of low competitive rates resulting from over-tonnage of the services.

To meet these excess costs of operation, aid should be given through mail contracts and appropriations for a Naval Reserve. The provisions for these aids should be sufficiently elastic to admit of the adjustment of the compensation to be paid in respect of mail and Naval Reserve services, to meet the varying needs in the different trades.

The provisions of the Wood bill vesting in the Postmaster General authority to make long term mail contracts, supplemented by the Copeland bill (S. 806), revising the Ocean Mail Act of 1891, are steps in the right direction, and meet with the approval of the associations. The rates of mail pay provided by the Copeland bill should be increased, and perhaps the authority of the Postmaster General in the Wood bill should be made somewhat more adequate.

These are matters, however, which can be discussed with greater particularity before the committees of Congress actually engaged in the framing of the legislation, so that we here only point out essential principles.

We understand that a comprehensive Naval Reserve bill is in course of preparation by the Navy Department.

The Retirement of the Government from the Shipping Business

If conditions generally are brought about in the shipping business so that the differentials in operating costs can be met, and replacements can be had at costs on a parity with the costs of building in foreign yards, then unquestionably a number, if not substantially all, of the services now being operated by the Shipping Board can be sold and the government retired from the shipping business.

There may be some services in which the handicaps of higher costs of construction and operation cannot be overcome by any reasonable means. If, under these conditions, the Shipping Board finds that it cannot sell such services, it will be highly questionable whether the services should be continued. Certainly in those instances the Shipping Board should make a most searching survey into the causes which make the services so unprofitable, and if there is no reasonable prospect of a particular service being made self-sustaining, then, unless there are other reasons than commercial, such as national defense, to justify its continuance, the service should be terminated.

Furthermore, an unsold service should only be continued with an operator who has the support of the communities primarily interested in the service, and has the financial ability and is prepared to buy and permanently maintain the service when it can be made self-sustaining, and will work to that end. New operating agreements should be drawn on that basis.

The government should also retire from the operation of Navy and Army transports whenever, in the judgment of the President, adequate transportation facilities are afforded by privately owned vessels. The associations approve the bill introduced by Senator Jones (S. 1608), which is designed to remedy this situation.

The associations believe that the Panama Railroad Company should not engage in a commercial business in competition with privately owned American ships which can give adequate service. According to its annual report, the company had last year 26 sailings of chartered vessels and only 7 of its owned vessels, and so extensive have its commercial operations become that it maintains a regular service beyond the Canal to South American ports, and makes regular calls at West Indies ports.

The Shipping Board is now possessed of a large number of unserviceable ships, and to the extent that there are replacements by newer, larger, faster ships, this number will be increased. The associations believe that these ships should be disposed of, and approve of the

ways and means for their disposition provided for in the Wood bill. The large laid-up fleet has had a deterrent effect upon American shipowners in the purchase of the present services operated by the Shipping Board.

The Amendment of the Navigation Laws to Make Them No More Burdensome Than the Laws of Other Maritime Countries

The Navigation Laws should be amended so as to make them no more burdensome than the laws of other maritime nations, with this proviso—that no change should be made which would reduce the standards of wages and living of American seamen or affect the safety or economic operation of the ships. Such changes would not only be unjust from a humanitarian point of view, but unwise from a business point of view.

There are changes, however, which can be made in our laws which will produce greater efficiency in operation, without affecting the standards of living or safety. These changes will remove some of the burdens which handicap American ships, and will thus make their operation more economical and place them more nearly on a parity in this regard with foreign ships, and to that extent will contribute to their permanent success.

To that end we recommend the following changes in the law:

(a) The Seamen's Act

(1) For some unknown reason there is the mistaken impression that American shipowners desire the repeal of the La Follette Seamen's Act. Nothing could be further from the truth. The associations do not want the Act repealed; they only ask that a few minor changes be made in the Act which will not affect the standards of living or the wages of the seamen.

The Act provides that a seaman must be paid on demand at each port one-half of the balance of his wages then earned and remaining unpaid, but not oftener than once in five days. The consequence is that many seamen demand their wages immediately upon arrival in a foreign port where liquor and narcotics can be purchased. The result has been that the seamen's wages have been squandered, and in many cases the men either desert or return to their ships in a condition rendering them unfit to perform their duties. This not only endangers the safety of the ships and the lives on board, but adds to the costs of operation through inefficiency and loss of time.

We do not suggest that all right of the seamen to receive partial payment of wages should be taken away from them, but we do think that the Seamen's Act (Section 4530, U.S. Rev. St.) should be amended so as to provide that the master of a vessel will not be required to pay wages to any seaman in a foreign port, if the head of the department in which the seaman is employed reports to the master and signs an entry in the ship's log to the effect that the seaman came on board in an intoxicated or doped condition, or was found to have liquor or narcotics in his possession on board the ship, or otherwise disobeyed orders, or did acts which interfered with the discipline of the ship or threatened her safety.

(2) The Act (Section 2) requires that the sailors shall, while at sea, be divided into at least two, and the firemen, oilers, and water-tenders into at least three, watches, which shall be kept on duty successively for the performance of ordinary work incident to the sailing and management of the vessel. The Supreme

(Continued on Page 30, Advertising Section)

The New Queen of the Intercoastal Service



Panama Pacific Line steamship California on her trial run.

Largest American-Built Passenger Liner

Steamship California, Setting New Standards in Intercoastal Passenger Traffic,
Now on Maiden Voyage Through the Panama Canal

LAUNCHED at Newport News October 1, 1927, delivered in the week ending January 14, and scheduled to sail on her maiden voyage from New York to the Pacific Coast on January 28, 1928, the steamship California, of the Panama-Pacific Line, largest American-built liner, and the world's largest commercial vessel with electric propulsion, stands at the head of a new and greater American merchant marine.

The California is a direct offspring of the Panama Canal. Had it not been completed, the present building program of her owners, the International Mercantile Marine Company, calling for this splendid vessel of 22,000 gross tons and 32,450 tons displacement and two others like her would not have been projected. In 1915, the first year the Canal was opened to traffic, the company instituted its Panama Pacific Line service between New York and California ports with two of its older transatlantic liners, the Kroonland and the Finland. Interrupted by the war, the service was resumed with the addition of two other ships of the transatlantic type. It has since prospered until the order for the construction of three of the largest and finest liners built under the flag has resulted.

Of Ocean Liner Type

In type the California is unique among the vessels engaged in intercoastal service, since she is the first steamship of transatlantic type to be built especially for service through the Panama Canal. Details of the type have been modified, as a matter of course, to meet the requirements of voyages that are largely through sub-tropical waters, but to all intents and purposes the new ship is an ocean liner of the highest class, in every feature of construction and equipment and the first of her kind to be designed expressly for the run between New York, San Francisco, and intermediate ports.

Her length is 601 feet, breadth 80 feet, depth of hull 52 feet and total depth from upper deck to keel, 100 feet. She has capacity for 8000 tons of freight and 750 passengers. Her maximum speed is 21 $\frac{3}{4}$ statute



The Newport News Shipbuilding & Dry Dock Company is building two vessels for the Panama Pacific Line, sister ships, the first of which, the steamship California, has been delivered and is now en route to California. These vessels are the world's largest electrically propelled commercial vessels and the largest American-built passenger liners. Newport News has good reason to be proud of its many fine products operating in the American merchant marine, climaxing in these two splendid vessels.

Homer L. Ferguson, president and guiding spirit of the Newport News Shipbuilding & Dry Dock Company, is shown above on the bridge of his latest child.

miles an hour, and though she will be run on regulated schedules to insure arrival at Havana and the Canal at stated hours, she will clip two days from the existing passage of fifteen days between New York and California.

Machinery

The California is driven by twin screws whose shafts are operated by two 8500-horsepower General Electric Company motors. These in turn derive their power from two General Electric Company steam turbine driven electric generators, taking steam from 12 Babcock & Wilcox water-tube boilers. This machinery and its control are described in detail in a separate article in this issue of Pacific Marine Review.

Passenger Accommodations

Study of the dignified interiors of early American mansions in New England, New York, Pennsylvania, Maryland, and Virginia and notable examples of Colonial rooms preserved in the American wing of the Metropolitan Museum of Art at New York, inspired the style in which the California's public apartments have been decorated.

In the larger rooms, such as the drawing room and ball room-lounge, purely Georgian design, as expressed in leading Colonial examples, has been followed. In the smoking rooms, natural pine paneling of early local origin, which now is having a merited revival, has been cleverly adapted. Wherever possible, native American woods have been employed. Panelings, pillars,



Vista of one of several promenade decks on the steamship California.



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From the front line five staircases lead to the decks above. To the left is the master's office, below the single staircase is the entrance. From the back come the stairs leading down to the lower deck and the lounge on the other

The striking character of the decorations in the California's public buildings is well illustrated in the interior of the ship's deck house. The walls of this room are tinted in cool apple green. The carpet, an American-woven Saxony, has a dark prune ground with gold rosettes. The room extends across the entire width of the deck house, the forward end being slightly curved. Window openings are of the proportions of a standard house window, with hangings of mulberry and gold damask, in a brocaded floral design. Seven of these window ports are in the broad view of the room and give a direct view across a shelter deck of the sea around which the ship is under way.

The lighting fixtures are gold with black striping, and details of hardware and decorations are particularly delicate and true to period. Against the rear wall stands a large mahogany bookcase, containing 1000 volumes, chiefly of American history, biography, and fiction, with a strong showing of books dealing with the development of the west.

Lounge is Also a Ballroom

The social center of the ship, the lounge, combines the features of a spacious living room and a ball room. Its dimensions are 46 by 50 feet and its floor space is in excess of that of an ordinary dwelling. Outstanding architectural features of this handsome room are a great bay window, fourteen feet wide, on either side; a stage 16 feet wide, for the dance orchestra, and for use in concerts; a wood-panelled ceiling; walls done in French gray, divided into panels by pilasters having carved caps; and a dome in the Georgian style, with glass and grill panels alternating in its sides. On the wall opposite the stage is a broad mirror cut in small sections, set with crystal rosettes, and beneath it is a wide stone jardiniere, filled with growing flowers, giving freshness and life to the design.

There is a hardwood dancing floor throughout the entire space in the lounge, covered with deep-pile rugs, the color being two tones of blue and sage green with a border of deep blue having a brick red design. All or part of these rugs can be taken up in a few minutes when space is desired for dancing.

Hangings and furniture carry out the bold color note of the carpet.



Furnished with carpets and comfortable overstuffeds chairs and davenportes, the main lounge can be easily converted, partly or wholly, into a ball room.

PRINCIPAL CHARACTERISTICS S.S. CALIFORNIA

Length	601 feet
Breadth	80 feet
Depth, molded	52 feet
Depth, U.D.	100 feet
Gross tons	22,000
Displacement, tons	32,500
Freight tons	8,000
Shaft H.P.	17,000
Max. Speed, knots	21.75

Twin Screw

Passengers:	
First Class	400
Tourist	350

Hangings are of Colonial linens, with black backgrounds and bright designs of flowers and birds. Furniture includes writing desks, tables for bridge and a variety of other pieces from frail gilt concert chairs to the heaviest easy chairs and overstuffeds sofas. Upholstery fabrics are chiefly in vivid colors.

Lounge Lobby Writing Room

Off the lounge, aft on the port side, is a lobby, or writing room, 30 feet long, that is most strikingly decorated. The walls are panelled in two tones of cafe au lait. The hangings of the large windows are in tete de negre, or two tones of brown, with a stripe of gold thread. There are two desks, a sofa upholstered in aqua marine, settees, and chairs all in satin-wood, and on the walls paintings in architectural style, depicting scenes on the Panama Canal. This apartment opens directly into the smoking room.

Early Colonial Smoking Rooms

With walls paneled in ripe old pine, a timbered ceiling, a carved wood mantel, an oak sideboard of the cupboard type, and lighting fixtures that include watchman's hexagonal lanterns in brass and pewter, this room represents the essence of early American decoration. The idea for its design is embodied in a room preserved in the American Wing of the Metropolitan Museum of Art—the kitchen of the "Parson" Capen house at Topsfield, Massachusetts, built in 1674.

This dignified background is brought out by an abundance of color in hangings and floor coverings, rich blue leathers in sofas and



The veranda cafe is a delightful nook for afternoon tiffin.

Related work on single beds and 2-person beds

space, to give comfort and durability, without detracting from the



Two styles of bedrooms in the first class accommodations

beauty of modern marine bedrooms.

Tourist Cabin Accommodations

Tourist cabin (not to be confused with "tourist third" to and from Europe) originated with the Panama Pacific Line, and established new standards in ocean travel. In building the California, the company had opportunity to create for "Tourist" accommodation no less comfortable than that in first cabin, and nearly as ornate in which everything is designed to give satisfaction to the traveler who seeks the best for his money on a modest budget.

Experienced travelers who have seen the Tourist accommodation on the California marvel not only at its spacious completeness, but also at its really luxurious appointments and the unusual taste and balance of its decorations.

"Tourist" has its own broad promenade deck. Its public rooms are large, airy and pleasingly decorated. The lounge, 42 by 48 feet, is paneled in old ivory, with hangings of rose, in small patterns, at windows of leaded glass. The floor has rubber-tile covering, in alternating squares of harmonious colors. Furniture is upholstered in tapestry. The same attention to color harmonies and appropriateness is evident here as in the ship's other public spaces. The dining saloon, extending the full width of the ship, is 73 by 38 feet, with tables for two, four or eight people, and a beautiful mahogany buffet, in the Heppelwhite style. The walls are in soft tones, and lighting fixtures in antique silver finish. Over the center is a dome with Colonial panelings. Service is from the same kitchens that serve first cabin.

In the tourist cabin smoking-rooms are panelings of old pine, and hardware and electric fixtures of antique brass. Furniture is upholstered in leather and tapestry. There are tables for cards and refreshments, placed in cosy niches, giving privacy and comfort. The room is 46 by 29 feet, and occupies a deck-house of its own, with ports on four sides.

In every tourist cabin stateroom there is a bed, taking the place of a lower berth, and used in combination with bed-berths of a new type. There are rooms for two, three, and four persons. All are equipped with high-grade bedding and floor coverings, running water at a fixed porcelain bowl, a clothes closet, and an electric fan.



A sitting room of one of the suites.

Provisions for Recreation

Most important of the California's exceptional provisions for recreation are two swimming pools, one for first, the other for tourist cabin, which are unlike anything seen on shipboard before.

Each pool is of the built-in type, affording opportunity to dive into clear sea water from the level of the deck. The first cabin pool is forward, on the main deck, and has a "gallery" athwart the deck above. The pool is 25 feet wide and 29 feet long, and holds 32,400 gallons, or 90 tons of water. The walls are of steel, enamelled, and there is a steel curbing to prevent water from spilling upon the deck. There is ample depth for safe diving from the springboard affixed to the forward edge of the pool.

The tourist cabin pool is on C deck, toward the stern, and is similar to the other. Its width is 21 feet and its length 25 feet. The deck around the tourist cabin smoking room affords ample space for an elevated gallery for this pool.

For Light Diversion

Open spaces on a single deck—A, on which the main public rooms are located—have a total area of 11,649 square feet, or more than a quarter of an acre. All this space is available to the passengers at all times for their diversion.

In addition, there is on A deck a most attractive apartment that serves the purpose of a summer garden, known as a verandah cafe. The

room, which is 46 by 21 feet, having wide doors opening upon the broad open space of the deck aft, is cleverly designed to convey the feeling of outdoor life. The windows have hangings of broad striped awning cloth, in green, salmon, and black. Between the windows on either side are bevelled mirrors, and beneath them are stone flower boxes, filled with blooming plants and vines. The walls, of a cream tone, have green trellised framings divided by pilasters, ornamented with frescoes and old gold borders. Small tables for the serving of refreshments, and wicker chairs, make this a most attractive place in which to while away an hour or two on a tropic voyage. Outside the cafe the clear expanse of deck is 78 feet wide by 30 feet. This, in a few minutes can be converted into an outdoor ballroom.

Other Provisions for Recreation

On the boat deck, above the verandah cafe and the smoking room, is a space 63 by 77 feet, set aside for sports, such as shuffleboard, deck tennis, and deck golf, and a track for horse racing. The racing, carried on with miniature steeds, is one of the most popular sports of the coast to coast voyage. Off the sports deck is a gymnasium, 15 by 29 feet, equipped with every type of approved electrical device for stirring sluggish circulation or building up muscle. Nearby is a fully furnished and handsomely decorated playroom for children, 15 by 23

with it on shipboard, however, for it is all triply filtered before it reaches consumers, whether passengers or crew.

For this purpose the ship is equipped with a filtration plant on the upper deck, to which all water used is pumped from the tanks in the ship's double bottom. The three filters, composed of 18 inches of charcoal between porous division plates, each takes care of sixteen gallons of water a minute. On leaving the filters the water passes into a service tank, and thence to the outlet where it is used. For drinking purposes all water is chilled, but not from the direct addition of ice. Coolers are piped from the ship's refrigeration plant, and the chilling comes from brine coils surrounding the water containers.

"But what would they do," asks the landsman, "if anything happened to the ship's fresh water tanks?"

The question has been anticipated, and its answer is found in a complete distilling plant, for converting sea water into the purest of fresh water. This plant, always ready though probably never to be used, includes three evaporators or boilers, for converting sea water to steam, each with a capacity of fifty tons of water every 24 hours, and two distillers that each will convert 10,000 gallons of sea water into pure fresh water in a day.

A Seagoing Garage

The space reserved for the California's garage, amidships on E deck, is reached through wide ports in the side of the ship. Wide gangplanks have been built to reach these ports from the dock.

When a car is to be put on board there is no need of slinging it for hoisting. It is rolled to the foot of the gangplank, and a light wire cable is attached to it. This cable leads to an electric winch in the garage. A turn of a switch, and the car starts up the gentle incline of the gang-plank, with a man at the wheel to guide it, as if it were under its own power.

Inside the garage are compartments formed by heavy timber uprights, set in sockets, and removable. When a given section of the garage has been filled, and the cars have been fastened to the floor by lashings passed through the wheels and attached to convenient ring-bolts, the partitions are put up, shutting off the space, though it is still open to inspection and the circulation of air through the open spaces between the uprights. This system of stowing cars gives each car as much space as it would have in a garage. It also makes unauthorized visits to the car impossible. When one space is full, another can be filled in order, until all spaces are taken.

The cars are arranged in sections according to their ports of destination. On westbound voyages those for San Francisco go in first, as they will come out last, and those for San Diego go in last, as they will come out first. On eastbound voyages all cars are destined for New York, but they can be put in to suit the convenience of the owners at unloading time.

Cars intended for shipment are checked like a trunk. The pier staff on receipt of a car drains its gasoline tank and radiator, checks up to see that the tool box is locked, and that no property has been left inside, and rolls the car off down the pier for shipment.

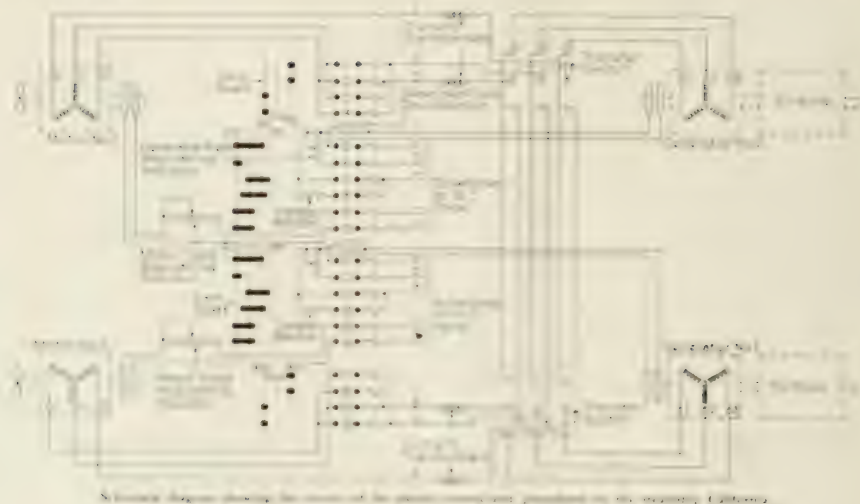
American Line Flag

Privately owned and operated, the California and her sister ships are direct successors of the famous old American Line fleet, as they are owned by the same company that operated the American Line, and fly the well known American Line house flag—a blue spread eagle on a white ground—that was flown by such famous transatlantic flyers as the New York and Paris, the St. Paul and the St. Louis, all of which passed on a few years ago, closing for the time being the transatlantic record of their company of more than fifty years of continuous service of de luxe travel across the Atlantic.

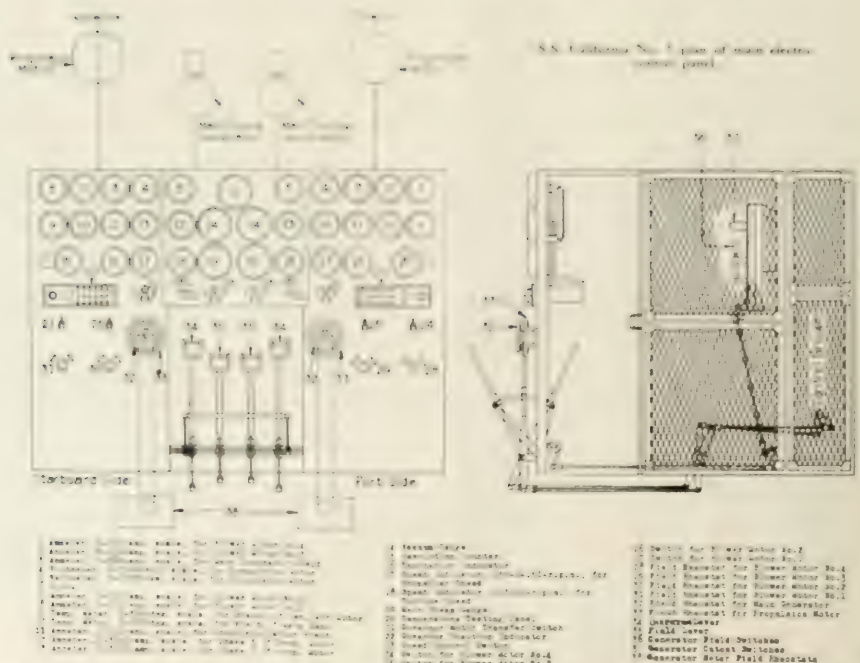


Two views of the first-class smoking room. This room is in early American colonial style, with beamed ceilings and walls paneled in ripe old pine. On the wall in the view above may be seen the map described in the text.

At the left is shown a vista through the smoking room and the writing room to the main lounge.



Schematic diagram showing the main circuit of the propulsion system of the steamship California.



Diagrammatic front and side elevations of the control panel and cage for the main propulsion circuits of the steamship California.

Electrical Equipment of the California

The General Electric Company Builds World's Largest Electric Propulsion Plant for Commercial Vessel

By Louis Rask, Federal and Marine Department,
General Electric Company

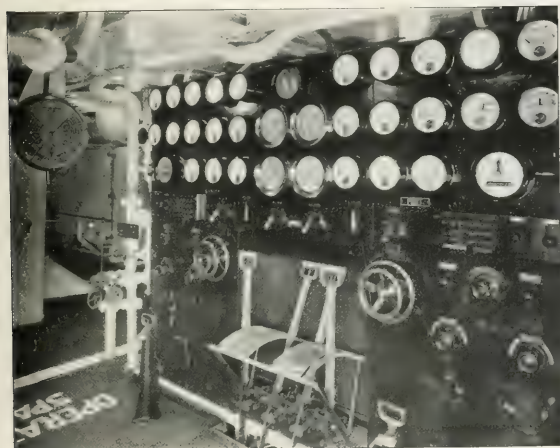
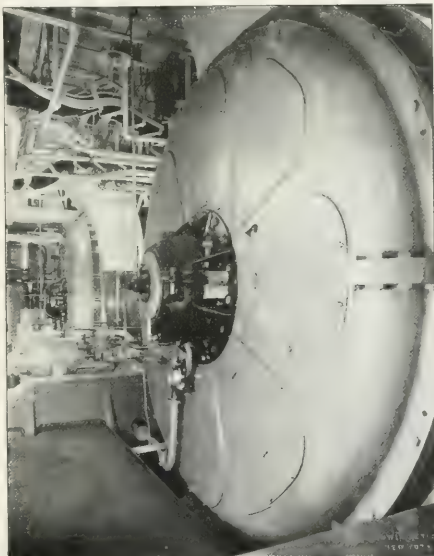
THE steamship California is one of two passenger vessels that have been ordered from the Newport News Shipbuilding & Dry Dock Company by the International Mercantile Marine Company, for service between New York and California, via Havana and the Panama Canal. The two vessels will be practically duplicates as regards motive power and auxiliary power, consisting of steam turbine driven generators and alternating current motors for propulsion, and direct current motors for all the auxiliary machinery.

Propulsion Machinery

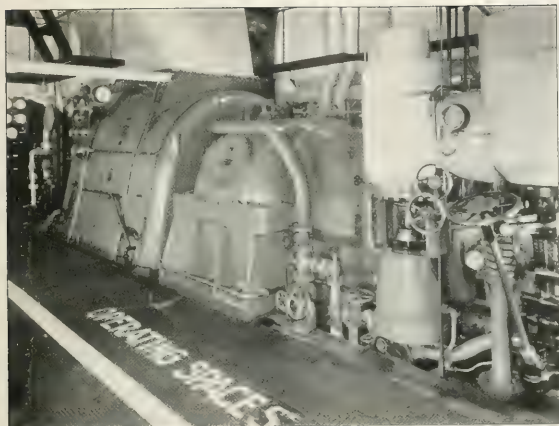
The main power plant consists of two marine type General Electric steam turbines, each rated 6750 shaft horsepower, 2640 revolutions per minute, the latter corresponding to approximately 110 revolutions per minute propeller speed. Each turbine has a maximum capacity of 8500 shaft horsepower, 2880 revolutions per minute (120 r.p.m. propeller speed). These turbines are each direct-connected to an alternating current generator rated 5250 kilowatts, 2640 revolutions per minute, 3700 volts, 3 phase, and having a maximum continuous rating of 6600 kilowatts, 4000 volts.

There are two main propulsion motors, one direct-connected to each propeller shaft, and each being of the induction synchronous type, rated 5250 kilowatts, 110 revolutions per minute, 3700 volts, 3 phase, (6,750 shaft horsepower). The maximum continuous rating of each motor is 6600 kilowatts, 120 revolutions per minute, 3700 volts, (8500 shaft horsepower). Each of these motors under normal operation is electrically connected each to its particular turbine generator and independent of the other, but provision is made so that either turbine generator can furnish power to both propelling motors in parallel.

The propulsion motors are ventilated by four direct-current, motor-driven exhaust fans automatically con-



In the power plant of the steamship California, electric power from the ship's central power plant is delivered to the operating control panel shown in the illustration on the left. On this panel are located the gauges necessary to give the operating engineer intelligent supervision of the boilers, turbines, generators, and propulsion motors. From this panel, and completely under the control of the operator, the electrical energy flows to the two huge propulsion motors, each of which is rated 8500 shaft horsepower at 120 revolutions. These motors are shown above, looking from port to starboard at the forward end of the motors.



On the California, twelve Babcock & Wilcox water-tube boilers supply steam at 275 pounds gauge pressure and 100 degrees Fahrenheit superheat to the General Electric turbo-generating sets, one of which is shown in this view. Each of the turbines rates 8500 shaft horsepower at 2880 revolutions a minute. The generator, at the same speed, rates 6600 kilowatts at 4000 volts. The turbine sits directly on top of its condenser casing and exhausts directly into the condenser in practically same manner as is now universal practice in large power plants ashore.

Pure lubricating oil for these turbines is insured by the use of De Laval Oil Purifiers.

cargo space. The cool air space is principally used for conveying California fruits, while 12,000 cubic feet of the frozen cargo space is for ship's purposes, and the remainder for cargo.

For this refrigeration there is provided the carbon dioxide compression brine circulating system, with motor driven brine circulating pumps. The equipment consists of four Brunswick-Kroeschell Co. carbon-dioxide electric motor driven compressors, each driven by a General Electric 100-horsepower, 250-volt, adjustable-speed, 250-325 revolutions per minute, direct-current motor, each motor being governed by manual control. There are also three single-stage Warren centrifugal pumps for circulating refrigerating brine, each driven by a General Electric 16-horsepower, 230-volt, adjustable-speed, 1400-1750 revolutions per minute, direct-current motor. Each pump delivers 300 gallons of brine per minute against a head of 50 pounds per square inch. Two refrigerating condenser circulating pumps of the single-stage, Warren, centrifugal type are each driven by a General Electric 15-horsepower, 230-volt, adjustable-speed, 950-1200 revolutions per minute, direct-current motor. A single-stage Warren centrifu-

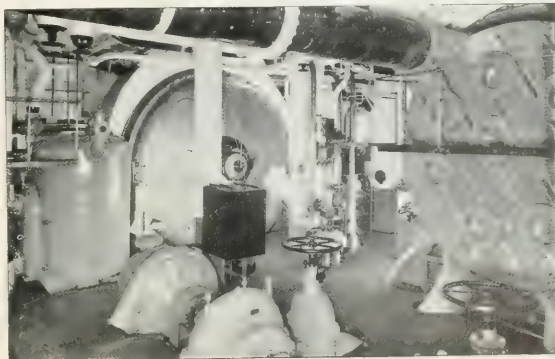
gal brine circulating pump is driven by a General Electric 5-horsepower, 230-volt, 1750 revolutions per minute, direct current motor.

The three 16-horsepower pumps are used for circulating the brine through the cooling pipes in the refrigeration rooms. The two 15-horsepower pumps circulate the refrigerating condenser cooling water (sea water). Each has a capacity of 750 gallons of sea water per minute against a head of 40 feet. The 5-horsepower pump is used to lift refrigerating brine to the refrigerator in the steward's stores room for cold storage of refreshments. This pump has a capacity of 25 gallons of brine per minute against a pressure of 50 pounds per square inch.

Steering Gear

The rudder is controlled by means of hydro-electric steering gear consisting of four cylinders with two double plungers, located forward of the rudder stock, with pumping sets in duplicate and with automatic follow-up mechanism. The gear is designed to stand the pressure incident to putting the rudder from hard-over to hard-over through an angle of 70 degrees in 30 sec-

A view in the motor room of the California showing the forward end of the port motor, the inboard end of the port condenser, a motor driven circulating pump, and several auxiliaries. Each condenser weighs about 96,000 pounds loaded with water. It is mounted on accurately fitted beam springs to take care of deflection and expansion strain.



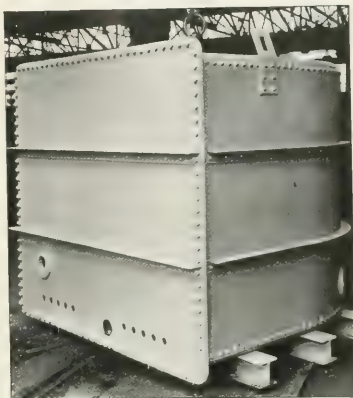
Auxiliaries-Ship Supplies-Marine Equipment

Refrigeration Equipment on the S. S. California

THE refrigeration machinery on the California is divided into two separate and distinct units; one unit provides a relatively low temperature brine and the other provides a relatively high temperature brine. The low temperature brine serves the refrigerated "cold cargo" compartments; the ship's stores refrigerators; the scuttle butt, which provides cooled drinking water; and a number of miscellaneous service boxes located on the promenade, forecabin, and upper decks. Circulation of brine to all of the foregoing is made through the brine pump A-B (see diagrammatic arrangement), excepting the miscellaneous service boxes which are serviced separately by the small brine pump S. The high temperature brine serves the coil chambers for the air cooled "high temperature cargo" compartments only; circulation of brine to the foregoing is made through the brine pump C-D.

The compressors A and B with their associated equipment carry, in addition to the load previously indicated, an ice set with capacity for making the one ton of ice per day and the ice cream storage. These are refrigerated by direct expansion instead of brine.

Two brine return tanks, one for low temperature and the other for high temperature brine, are located in a small insulated compartment on the deck above the carbon dioxide evaporators. To these two return tanks the respective low temperature and high temperature brine return lines are made from coil circuits in the various compartments. Valves are located at the end of each line so that the control of brine to all compartments can be made directly in the brine return tank room. The brine return tank room is directly accessible from the refrigerating machine room. The refrigerated spaces are grouped together and located directly above



Evaporator tank for the refrigerating machine room of the California. This tank is one of four.

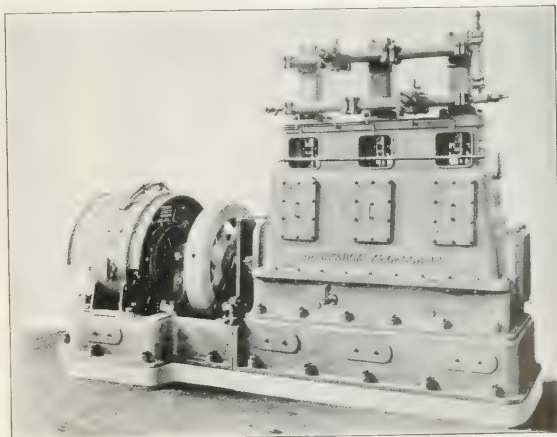
and adjacent to the refrigerating machinery room, which is located in a space directly aft of the main engine room.

The ship's stores refrigerators are located and grouped together on the main deck. This group consists of:

Ship's Stores	Size Cu. Ft.	Temp. Deg. F.
Westbound meat	3260	20
Eastbound meat	3260	20
Thawing room	1460	50
Ice cream and ice	2420	20
Vegetable room	1265	38
Fish room	780	25
Poultry and meats	1265	25
Smoked meats	655	35
Dairy products	1170	35
Fruit room	1170	38
Milk room	650	32

A scuttle butt for cooling sufficient drinking water for the passengers and crew is located in the brine return tank room and is designed for cooling 60 gallons of water per hour through a range of 45 degrees Fahrenheit and cooling 300 gallons of recirculated water through a range of 10 degrees Fahrenheit.

The ship's "low temperature cargo," with a total capacity of 36,000 cubic feet space, is divided into four separate compartments, one in the hold directly aft of the refrigerating machinery room and three on the orlop deck directly above. All are piped with ceiling coils as well as wall coils, so that a temperature of 15 to 20 degrees Fahrenheit may be maintained. With the wall coils alone, a temperature of 35 to 50 degrees Fahrenheit is easily held.



One of the four Brunswick-Kroeschell direct-connected, electrically driven carbon dioxide compressors.

For each of the two air-cooled compartments there are two fans, each of sufficient capacity to circulate 25,000 cubic feet of air per minute, the full amount required in each compartment. These fans are so installed that the direction of flow can be reversed by simply changing the operation from one fan to the other.

During normal operating conditions, but one compressor, condenser, and evaporator are in operation on either side. Only during loading or emergency conditions is the operation of all units on either side necessary. The units on either side are arranged with cross-over connections so that practically any combination of equipment desired can be obtained. For instance, on the low temperature brine side, Compressor A or B, or both, can be

operated in conjunction with Condenser A or B, or both, and Evaporator A or B, or both. Similarly, equipment on the high temperature side can be operated. The equipment is still further cross-connected so that in emergency conditions, if necessary, Compressor A can be operated on the high temperature side, or Compressor D can be operated on the low temperature side. Receivers are cross-connected so that, if necessary, one can be cut out and the other receiver used for operation of entire plant. Brine connections are arranged so that spare brine pump can take the place of either pump A-B or C-D.

The complete refrigerating plant was designed and supplied by the Brunswick - Kroeschell Company, New Brunswick, New Jersey.

Magnetic Compass Equipment

THE Kelvin and Wilfrid O. White Company of Boston and New York supplied the steamship California with its universally well-known Kelvin-White compass and binnacle equipment as follows:

The Kelvin 10-inch Dry Card standard compass;

The Kelvin-White 9-inch under-lighted liquid steering compass and binnacle.

The Kelvin Standard Dry Card Compass was scientifically designed by Lord Kelvin so that changes of latitude and changes of magnetism encountered by a vessel on varying routes do not produce any abnormal deviation of the compass itself. This instrument, as fitted with the Kelvin Azimuth mirror, is especially adapted to taking compass azimuth bearings under rough weather condition, since the image of the sun or star is reflected directly on to the edge of the card by a prism which automatically compensates for yaw and heel.

Another interesting feature about the dry card compass is that it is just as active in the coldest weather as it is in the heat of the summer, whereas with a liquid compass, when the temperature goes down, the compass itself begins to slow up and loses its sensitiveness.

The Kelvin-White 9-inch liquid steering compass and binnacle has been developed by them so that it is the standard for a great many companies in the United States, the underlighting features making it

especially suitable for pilot house work, as the binnacle head is dispensed with and the officer on watch can easily check the course without looking over the quarter-master's shoulder, as in the old type of binnacle.

Description of Wheeler Equipment on S. S. California

AIR-EJECTOR equipment on both the main and auxiliary dynamo condensers for the steamship California was furnished by the C. H. Wheeler Manufacturing Company of Philadelphia. For the main condenser the equipment consists of two 2-stage Radojet air pumps mounted on one combined surface after condenser. Either Radojet alone will produce a vacuum of 29 inches or more, the other being used for stand-by or emergency service. The Radojets are so arranged that either may be inspected or cleaned while the other is in full operation.

A feature of interest in this installation is the arrangement for the recovery of the heat from the steam used to operate the air pumps. The circulating water in the after condenser is taken from the main condenser pump and is returned directly to the boiler after performing its function in the after condenser. A further advantage of this arrangement lies in the fact

All materials used in the manufacture of these compasses and binnacles (with the exception of the needles, quadrantal balls, and Flen-ders bars) are tested to make sure that they are completely non-magnetic. Scrupulous attention is paid to every item involved in the manufacturing process to make sure the instrument will perform accurately under the most trying conditions at sea.

There is also installed a Kelvin motor-driven sounding machine identical with that used on the steamship Mauretania and other transatlantic vessels and is capable of taking soundings at high speed. This machine has an automatic friction brake which prevents the wire from running out too fast and becoming kinked, in which case when the strain came on, the wire would part. But with this friction device this is practically overcome, as there is slight tension on the wire while it is running out. The Kelvin & Wilfrid O. White Co., of Boston, have supplied similar equipment to a great many of the best known fleets in the United States such as the Standard Oil Company, the United States Steel Corporation, and a great many others.

that the de-aerated condensate, although retaining the heat of the motive steam of the Radojet air pump, does not come into direct contact with the exhausted air and is delivered de-aerated to the boiler feed pump.

A similar arrangement of two Radojets on one combined surface after condenser serves the auxiliary condensers of the four dynamo turbines. Heat transfer and de-aerating features are analogous to the larger installation. The entire Radojet air pump equipment is characterized by low steam consumption, ease of maintenance, conservation of space and weight, and absolute operating reliability.

Long Beach. Harbor Engineer Major R. G. McGlone has recommended to the city council a bond issue for \$2,000,000 for the construction of wharves, warehouses, slips, docks, and piers in Long Beach inner and outer harbors.

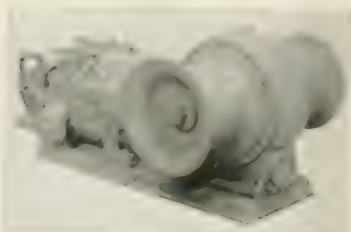
Hyde Windlass Company Equipment on California

THE Hyde Windlass Company of San Francisco supplies the following deck machinery for the company's boats:

- 1 Motor winches
- 1 Electrically operated pump
- 1 Electrically operated rudder
- 1 Electrically operated steering gear
- 1 Electrically operated winch
- 1 Electrically operated pump

The electrically operated pump is of the centrifugal type and is arranged for operating independently of one another. The engine for the centrifugal type self-contained pump is placed in the stern of the boat. The electrically operated pump is of the centrifugal type and is arranged for operating independently of one another. The engine for the centrifugal type self-contained pump is placed in the stern of the boat. The electrically operated pump is of the centrifugal type and is arranged for operating independently of one another. The engine for the centrifugal type self-contained pump is placed in the stern of the boat.

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One of the three electrically driven winches.

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There are three electrically driven

winches. Each of the winches is of the centrifugal type and is arranged for operating independently of one another. The engine for the centrifugal type self-contained pump is placed in the stern of the boat. The electrically operated pump is of the centrifugal type and is arranged for operating independently of one another. The engine for the centrifugal type self-contained pump is placed in the stern of the boat.

There are four electrically operated boat winches, each winch having two horizontal gypsies 15-inch diameter barrel driven by motor through worm gearing enclosed in oil-tight case. The motors are



There are three electrically driven, non-reversible, worm-gearing winches like that shown above, each of which has a capacity for 27,000 pounds pull at a speed of 50 feet per minute.



The Hyde steering gear is of the hydroelectric type, with two Waterbury pump units, each driven by a 75-horsepower motor and each capable of operating the steering gear under full speed conditions.

February

25-horsepower and fitted with magnetic solenoid brakes; each of these winches would have a capacity of pull of 5000 pounds at a speed of 100 feet per minute.

There is one steam warping winch of the compound geared type having double cylinders 10 inches in diameter by 14-inch stroke; the engine is reversible by means of reversing valve; the winch has large warping heads on extended shaft with heavy bearings for supporting to shaft; the warping heads are 26-inch diameter in smallest part.

Paracoil Equipment on California

THE Davis Engineering Corporation of New York furnished a number of its Paracoil steam specialties for the steamer California. These included:

3 Paracoil feed water heaters of the improved type;

3 Paracoil evaporators each with a capacity of 50 tons of sea water per 24 hours;

1 Paracoil distiller;

Paracoil steam traps;

Paracoil clean steam generator for galley service.

Paracoil feed water heaters are of the closed circuit type. The exhaust steam passing through a tight cast iron shell from top to bottom heats the feed water, which passes through from bottom to top in nested coils of seamless drawn copper



The Hyde steam windlass capable of raising simultaneously 60 fathoms of stud link 3-1/8 inch steel cable and two 17,150-pound anchors at a speed of 6 fathoms per minute.

tubing. The coils are so arranged that any one coil may be removed without disturbing the others. Water manifolds and coils are tested to 400 pounds pressure and the steam chamber to 50 pounds. A large door free from all pipe connections gives easy access to the coils. It is claimed that this arrangement gives less trouble and is easier to repair than any other. The exhaust steam does not mix with

the feed water, and no oil gets into the boilers.

The Paracoil steam trap is a very simple, efficient, nonreturn trap, the principle feature of which is a recessed ball valve arranged so that in closing the edges of the recess in the ball rub on the seat with a scraping action which clears the seat of any foreign material and makes for a tight valve.

These traps are guaranteed free from repairs for two years, if installed according to directions.

Griscom-Russell Apparatus on the California

THE Griscom-Russell Company of Massillon, Ohio, supplied to the steamship California the following water purifying and heat transfer equipment:

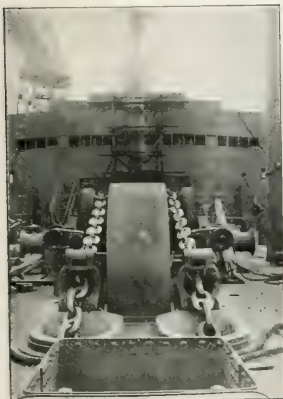
One 7-inch Griscom-Russell vertical multiscreen filter of cast steel construction, suitable for a working pressure of 400 pounds per square inch. This unit is designed to handle the entire feed for all boilers. It will be located in the feed line between the feed pumps and the heater, and thus will be operating under full boiler pressure. The filtering medium is of special terry cloth, and the large amount of surface furnished assures slow and effective filtration, thus insuring the removal of all grease or oil that may be present in the feed water.

One 21-1/2-inch Griscom-Russell standard multiscreen filter for the purification of fresh water used for culinary service is installed in the fresh water line between the pumps and the gravity tank and is designed to operate constantly at a pressure of 80 pounds per square inch. This filter, too, uses a special terry cloth for the removal of any oil par-

ticles or other impurities that may be present in the fresh water system.

Two No. 122-112 multiwhirl lubricating oil coolers are installed, each capable of cooling 200 gallons per minute of heavy lubricating oil from 140 to 110 degrees Fahrenheit, when supplied with 400 gallons per minute of cooling water at 86 degrees.

The absorption in each unit will amount to 1,350,000 B.T.U.'s per hour, assuring ample cooling for the bearings and gears even under severe overload conditions. These coolers contain the novel multiwhirl baffle which directs the flow of oil at right angles over the tubes and insures constant scouring action. This means that the cooling surface will remain clean and effective for long periods of time without necessity of cleaning. Expansion between the tubes and shell is taken care of by the floating head construction, which permits rigid metal-to-metal joints between the tubes and tube sheets at both ends and thus avoids all internal packed joints. The floating head is of the external packed



View looking aft across the hawse pipes, devil's claws, and wildcats of the California, featuring the 3-1/8 inch Naco cast steel stud link chain cable.

April 1914 that the American ship was transferred to the British, under a charter by the British Admiralty. The vessel was then transferred to the United States Navy, and was used as a transport ship. It was then transferred to the United States Navy, and was used as a transport ship. It was then transferred to the United States Navy, and was used as a transport ship.

Sperry Equipment on the California

Many of the most important features of the general equipment of the ship, particularly arranged, have been furnished by the Sperry company and other agencies of the Sperry firm and the others. These were the result of a study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

The ship's equipment will be the most important equipment of the ship, and it is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

A Sperry motor engine will be the most important engine of the ship, and it is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

At each end of the bridge, there is mounted an 18-inch Sperry searchlight of the incandescent type.

The gyropilot mounted in the hull is the most important feature of the ship, and it is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

Electric Fixtures on the California

The electric fixtures of the California were designed by the General and Northern California Electric and Lighting Company. The company is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

which would be the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

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California's Handy Billy

Although the ship's equipment will be the most important equipment of the ship, and it is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

These splendid pumps, The W. & B. Douglas Pump Company has the reputation of producing the finest type of hand pump for this work for many years, and has probably outfitted more steam and sailing vessels with this type of pump than any other firm in America.



The Ridge Pipe Wrench

The Ridge Pipe Wrench is a tool which is used for tightening and loosening pipe fittings. It is the result of the Sperry company's study of the ship's requirements, and the result of the Sperry company's study of the ship's requirements.

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They are guaranteed to be unbreakable, even under brutal usage—in fact, the pipe will break before the wrench. Another valuable feature of the Ridge Wrench is that it is calibrated, so that it can be set to the size of the pipe instantly. It is made in both right angle and straight end types, features which commend themselves to marine engineers who at times are obliged to use pipe wrenches in very awkward and constricted places, so that a wrench which can be used in a very narrow space is a most valuable auxiliary in an engine room kit at sea. The Ridge is made in sizes from 6 to 48 inches, all equally well built and finished. The way these wrenches are being called for by users of such tools shows that they are about the best thing for the purpose so far produced, and it is doubtful if a better wrench will be put out for some time to come.

The General Machinery and Supply Company is also the Northern California distributors for the world famous Powell valves, which are so favorably known to all marine engineers.

Palmetto Packing on the Pacific

MARINE engineers whose hair is now white used Palmetto packing years ago. Then the name was synonymous with a packing especially adapted for making steam-tight the stems of valves which were under severe service, such as stop and check, and valves around superheaters. The ease with which this packing could be applied and its holding up properties made it a favorite among the men who handled steam plants, both ashore and afloat.

The lapse of years has in no way destroyed the excellence of Palmetto, for as steam pressures grew higher, and superheat hotter, the manufacturers of this packing improved their product to meet conditions.

In addition to the twist type.

Greene-Tweed & Co. of New York, manufacturers of Palmetto packing, turn out a braided square type which has all the good qualities of the other and is made in sizes from $\frac{1}{4}$ to 2 inches. These packings are of highest quality, and will hold their own against gas, steam, hot water, ammonia, or oil. This makes the line valuable for ship use, as all conditions can be met and handled with one brand.

But to meet a demand for a cotton packing for hydraulic purposes only, the Palco brand has been brought out, and is up to the high standard of the Palmetto. Palco will not hold up under high heat and has not been made for that. But for pumps, especially centrifugals, which engineers know are severe on shaft packing, Palco is ideal.

A special feature of the Palmetto and Palco packings is that the materials are carefully chosen, being of long fibre asbestos in the one and long fibre cotton in the other. These materials are treated with improved processes to impregnate them with graphite and lubricants which will hold on for the life of the article.

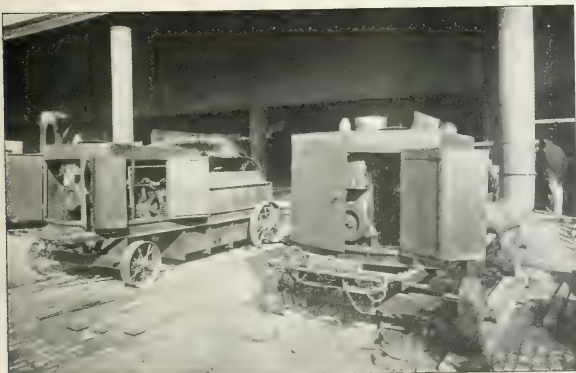
The H. N. Cook Belting Company of San Francisco is distributor of Palmetto lines, and carries large stocks from which the engineer can always select just what he needs. Warren & Bailey, of Los Angeles, are Southern California agents, and keep supplies up to the same standard. In Seattle the Palmetto representatives are the Steam Supply & Rubber Company and the old-established firm of Sunde & d'Evers Company.

Industrial Flooring for Port Terminals

JOHNS - MANVILLE industrial flooring has been installed by the manufacturer right over the old wood floor in the Santa Fe freight house at China Basin terminal, San Francisco.

This flooring was selected by the Atchison, Topeka and Santa Fe Railway because of its extreme durability under constantly heavy trucking. It is resilient, allowing faster trucking and reducing wear and tear on the equipment.

Johns-Manville industrial flooring is fire-retardant to a high de-



Upper, Santa Fe freight house, with Johns-Manville industrial flooring.
Lower, special mixing machines on the job.

gree. It presents a non-slip surface, which is waterproof, dustless, and sanitary, and is not tiring to employees.

The success of this type of flooring is largely dependent upon the incorporation throughout the mix of sufficient fine mineral needed for density and toughness, and the thorough distribution of the entire aggregate, insuring uniformity. Johns-Manville has amply provided for this by shipping the mastic material in block form from the factory. The blocks are then broken up, melted down, and mixed with the other mineral aggregate. Thorough incorporation of the mineral in the field is assured by modern mixing machines specially designed for this purpose.

John Crane Metallic Packing Improves Condenser Performance

By E. N. Whiston

THE Isthmian Steamship Line has been successful in its quest for better condenser performance. The company has been using John Crane metallic packing for some time and has been very successful in its quest for better condenser performance. The company has been using John Crane metallic packing for some time and has been very successful in its quest for better condenser performance.

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Accordingly, one of their ships, the Steel Mariner, a turbine driven ship, was selected for the test. Her main condenser was packed, at both ends, with John Crane metallic packing, backed up with ferrules. The job was installed in the early part of August, 1923, and from the very beginning the resulting condenser was absolutely satisfactory.

It is not, of course, that the condenser is perfect in itself and that it will perform in an efficient manner, but that it is so efficient that it will perform in an efficient manner.

The success of the packing was due to the fact that the Isthmian Steamship Line had been using John Crane metallic packing for some time and had been very successful in its quest for better condenser performance. The company has been using John Crane metallic packing for some time and has been very successful in its quest for better condenser performance.

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The Isthmian Steamship Line then decided to equip the main condenser of the Steel Seafarer with metallic packing. The new method of packing was submitted for their approval, and after due consideration and study the Isthmian Lines gave the Crane Packing Company authority to go ahead and pack this condenser with the new method.

Several radical departures from the orthodox style of packing were made. First, all ferrules were discarded—a large saving being effected here. At the inflow end of the tube a special vulcanized fiber bushing, with a metallic bonding member, was slipped over the tube and driven into place. The tube was then expanded into the bushing and

the tube was then driven into place. At the outflow end the tube was expanded into place. The tube was then driven into place. The tube was then expanded into place. The tube was then driven into place. The tube was then expanded into place.

The success of the new method of packing was due to the fact that the Isthmian Steamship Line had been using John Crane metallic packing for some time and had been very successful in its quest for better condenser performance. The company has been using John Crane metallic packing for some time and has been very successful in its quest for better condenser performance.

The Isthmian Steamship Lines are now using John Crane metallic packing in the main condensers of the following ships: Steel Mariner, Selma City, Knoxville City, Fairfield City, Steel Seafarer, Steel Ranger, Ensley City, Steel Engineer, Steel Trader, Steel Inventor, Steel Navigator, Steel Age, Craster Hall, Memphis City, Steel Voyager, Bessemer City, Atlanta City, Birmingham City, Steel Scientist, Santa Rosalia, Anniston City, Chickasaw City.

The Isthmian Steamship Lines have thus demonstrated beyond a doubt their desire for improvement and ability to keep the ships of their fleet up to the last word in efficiency of performance. The Crane Packing Company is proud to have been able to contribute, in a measure, to the success of their efforts.

The Crane Packing Company have recently opened an office at 667A Howard street, San Francisco, with Graham Smith in charge. A full stock of all styles and sizes of John Crane packings will be carried at all times. The opening of this office has been made necessary by the increased business on the Pacific Coast, and the necessity for a complete stock of packings available for immediate delivery.

Pacific Workboats and Their Power Plants

New Auxiliary Schooner For the Royal Canadian Mounted Police for Use in the Arctic

UP until the present time the officers of the Royal Canadian Mounted Police have been largely dependent upon the good ships of the Hudson's Bay Company for the transportation of supplies to their remote posts in the Arctic, far east of Herschel Island. There has been a need for some time for a boat for this service, not only for the transportation of equipment and supplies, but as an aid to the maintenance of law and order, for which the Royal Canadian Mounted

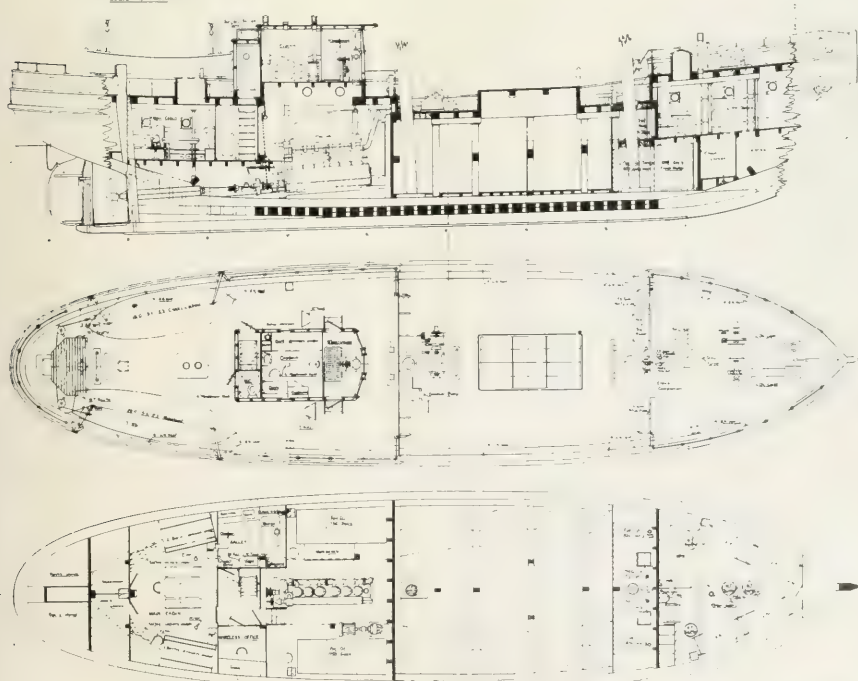
Police have long been famous. It has been said that a good deal of credit is due Corporal Paisley for impressing upon the Department the urgent need of a boat for this service.

Plans and specifications for a new boat were accordingly prepared by Charles Duguid, naval constructor to the Department of Marine, Ottawa, while the lines of the boat were drawn by T. Halliday, naval architect of Vancouver, British Columbia. The contract for construc-

tion of the vessel has been awarded to the Burrard Drydock Company, Limited, of North Vancouver. It is probable that this will be the most notable shipbuilding job in Vancouver this spring.

Every precaution has been taken in the selection of suitable machinery for the new vessel, since this boat will go north about the first of May 1928, and will probably stay in the Arctic for four or five years before returning. Being far from any repair shop for a number of

GENERAL ARRANGEMENT
AUXILIARY SCHOONER
R.C.M.P. - ARCTIC SUBDIVISION
Displacement 300 Tons



Marine Insurance

Edited by JAMES A. QUINBY

The Insurer's Right of Subrogation

EVERY so often, in the course of human events, the Blank Insurance Company insures Mr. Owner's \$40,000 ship for \$20,000, pays him the \$20,000 after a particular average accident, and recovers the whole \$40,000 in a suit against a third party. Or Mr. Owner, after receiving the \$20,000 payment, proceeds against the evil-doer and recovers the whole \$40,000. An argument immediately arises as to how much of the \$40,000 so recovered should accrue to the insurer. The law, however, is perfectly clear in upholding the insurer's right to retain or regain exactly the amount he has paid out, irrespective of the excess recovered. Consequently, in each of the above instances, the company would acquire \$20,000 from the fund recovered.

When the sum recovered is less than the amount paid under the policy, the principle is the same, and insurer is entitled to recover the entire amount paid out, under the theory that a marine insurance policy is a contract of indemnity only, and the assured should not be allowed to recover twice for the same loss.

Recent English Decision

We are indebted to the December 15th issue of "Fairplay" for what is apparently the most recent English case in point.

In this case, the owners of the good ship Goole had her insured under the Institute time clauses upon an agreed valuation of £4000. During the currency of the policy, the Goole came into collision with the Delphinus, and was so badly damaged that her cost of repair amounted to £5000.

In a subsequent action for collision damages, both vessels were found to blame, and the owners of the Delphinus promptly paid the owners of the Goole £2500.

The adjusters of general and particular average on the Goole then proceeded to draw up a statement, in which each expenditure was charged against its proportion of the £2500 recovered, in order to arrive at the net loss to the Goole. By such method, the net loss proved to be less than £4000, the insured value in the policy,

"SERVICE"

Some words are gilded charlatans that live a life of ease
And some are bent for overwork, with patches on their knees

Some things that humans will not do for liquor, loot or love
Are brought to pass by whispering the word set down above

For service to a client I will scrub a kitchen floor,
Or rock with mirth at stories which I've often heard before.

I'll join a club, or translate Greek, or play the flute, or tat.
I'll dip my ears in lager beers and manicure the cat,

Oh sing a song of service clubs, all sitting in a row,
All hating service like the deuce, but scared to let it go.

J. A. Q.

and the adjusters proceeded to charge the underwriters with the whole of such net loss.

The underwriters, of course, contended that the gross claim should have been charged to them, up to £4000, against which they should be allowed a credit for the £2500. Justice Mackinnon of the King's Bench division gave judgment for the underwriters.

Net Recovery Sustained

His lordship based his decision upon a long line of English cases and upon the provision of Sec. 79 of the Marine Insurance Act, reading as follows:

(1) Where the insurer pays for a total loss either of the whole, or in the case of goods of any apportionable part, of the subject matter insured, he thereupon becomes entitled to take over the interest of the assured in whatever may remain of the subject matter so paid for, and he is thereby subrogated to all the rights and remedies of the assured in and in respect of that subject matter, as from the time of the casualty causing the loss.

(2) Subject to the foregoing provisions, where the insurer pays for a partial loss, he acquires no title to the subject matter insured, or such part of it as may remain, but he is thereupon subrogated to all rights and remedies of the assured in and in respect of the subject matter insured as from the time of the casualty causing the loss, in so far as the assured has been indemnified, according to this Act, by such payment for the loss.

Justice Mackinnon pointed out that the insurers were entitled to assert that they had paid the whole of the particular average claim up to the amount insured, and were thus entitled to credit for the entire £2500 received by the assured from the Delphinus.

This decision involves no new principle of law. Indeed, it is surprising that the case should have arisen in England, where the doctrine of full recovery appears to be well settled.

In *Castellain versus Preston*, 11 Q.B.D. 388, Bowen,

Arthur M. Brown **EDWARD BROWN & SONS** Arthur M. Brown, Jr.

MARINE DEPARTMENT—Harry W. Browne, Manager

PACIFIC COAST GENERAL AGENTS

THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.

200 BUSH STREET, SAN FRANCISCO

It appears, therefore, under both English and American law, that the assured does not share in recoveries from third parties until his underwriters have been

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LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

909 COLMAN BUILDING, SEATTLE, WASHINGTON

fully reimbursed for their payments under the policy.

Dirty Work at the Crossroads

FROM the following extracts from "La Republique" for November 9 to 15, 1927, we gather that all is not quiet along the Bosphorus. We also note a slight insinuation that the lot of the stool-pigeon in Constantinople is not a happy one.

The Milliet

November 9, 1927.

The Administration of the "Monopole du Port" has lately discovered a vast organization of crooks who collect large sums from insurance companies for losses which existed only in their imagination. Thus they have cashed more than Ltqs. 10,000 (£1000). How has this fraud perpetrated on such a large scale been discovered?

The "Societe du Port" recently learned that various insurance companies paid recently large indemnities for damage to goods insured by them. On the other hand statistics established contrarily, namely, that there were less thefts and cases of damage than during the last year.

The administration of the Monopole applied to the agents of companies but not having been able to obtain details applied to the head offices of these companies. They then received all the required information. They immediately started inquiring by studying the cases signalled to them.

On the 9th of May, Mehmed, owner of Lighter No. 441, pretended that 125 sacks of coffee discharged from the steamship Phrygie and transported in his lighter were damaged, the sea being rough.

Thus he went to the 4th Notary Public, accompanied by Riza and Abdullah and his sailors, and was able with their attestation to certify the damage.

A document had been drawn up to this effect and the so-called damaged sacks of coffee shown to an employee of the Insurance Company, who paid Ltqs. 10,000 on the basis of the documents produced.

On the other hand the inquiry shows that lighter No. 441 does not belong to Mehmed and that on the date in question it transported hides and not sacks of coffee.

This Mehmed, accompanied by the same persons and in the same circumstances, certified damage to goods transported by Lighter No. 521 and 362, always at the same Notary Public.

The Court, having taken the matter in hand of this fraud of great extent, when the inquiry will have finished promises surprising revelations.

Vengeance of Lightermen

November 15, 1927.

The lightermen, Ineboloulou Djubedji Mehmed, Menchour Mehmed, Mehmed Ali, and Koyouk-Moustafa have been striving for some days between themselves to discover how the secret of the false certificates had been discovered by the Port Direction. They were surprised and exasperated. The day before yesterday, Djubedji Mehmed declared suddenly to his comrades that the denunciator was none other than their friend a certain Kara Moustafa. Upon this, the lighterman started searching for the latter to give him a good lesson.

Kara Moustafa had just returned from a voyage in the Black Sea. Towards midday the whole crowd met at Kemer-Akti. The lightermen brutally summoned Kara Moustafa to stop and Menchour Mehmed, drawing his knife, threw himself upon him and plunged it to the hilt in the region of the heart. The unfortunate let out a shriek and dropped to the ground. The aggressors immediately fled. The police agents, intervening, transported the wounded man to St. George's hospital. His wound is very serious. The culprits were arrested and conducted to prison. An inquiry is opened.

"To Pay as Paid Thereon"

Santa Claus may come and go, but still we have with us the little differences of opinion which arise between original insurers and their reinsurers. When a reinsurer agrees to pay under an original policy "as paid thereon," how many mental reservations may he have in mind? The latest light on the subject is found in the case of Fireman's Fund Insurance Company versus Western Australian Insurance Company, Limited, and The Atlantic Assurance Company, Limited, XXXIII. Commercial Cases at page 36.

It seems that the Fireman's Fund insured a shipment of gunpowder from New York to La Plata, under their usual form of marine policy covering against loss by sea perils, including jettison. The gunpowder was loaded aboard the steamer Hyannis, a wooden steamer chartered from the Shipping Board, and the venture proceeded merrily on its way. The joker in the deck soon became evident. A quantity of sulphuric acid was also aboard, and, what is more important, the aforesaid H₂SO₄ became disagreeable, troublesome, and mutinous, evincing a tendency to wander about the ship, to the great detriment of the peace of mind of those on board; for, as everyone knows, gunpowder and peripatetic sulphuric acid are not the best of shipmates.

Balfour, Kessler Agencies Inc.

Marine Insurance Department

Agents for

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UNION OF CANTON
QUEENSLAND YANG TZE

BRITISH AND FOREIGN
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LOUIS ROSENTHAL

General Agent

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Union Marine Ins. Co., Ltd.

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PACIFIC COAST BRANCH

(Marine Department)

114 SANSOME STREET

Phone Douglas 6013

MARINE DEPARTMENT

J. B. F. Davis & Son

Standard Marine Insurance Co.
National Union Fire Ins. Co.
Mercantile Insurance Co.
of America

240 SANSOME STREET
SAN FRANCISCO — CALIFORNIA

Marsh & McLennan

INSURANCE BROKERS

AVERAGE ADJUSTERS

SAN FRANCISCO
SEATTLE — LOS ANGELES

ROY C. WARD

GEO. B. DINSMORE

WILFRED PAGE

GEO. E. BILLINGS COMPANY

308-12 CALIFORNIA STREET, SAN FRANCISCO.

DOUGLAS 6400

INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

So the good ship Hyannis put into Barbados for repair. But the harbor authorities at Barbados had an idea or two of their own about gunpowder in town, and the explosive substance was jettisoned by official order.

The Fireman's Fund paid the loss, which is a habit they have. It's a good habit or a bad one, depending on whether you're a policyholder or a reinsurer.

When the reinsurers were asked to contribute, they demurred. A great many things had turned up in the meantime. The sulphuric acid had been shipped in insufficient containers and was improperly stowed on the vessel, the top tier of drums being placed in such a way as to roll about when the ship struck rough going. The Fireman's Fund pointed to the "pay as paid thereon" and "seaworthiness admitted" clauses in the policy of re-insurance, and demanded the cash.

The court found that the Hyannis was in fact unseaworthy when she sailed on her voyage, and the Fireman's Fund were not liable for a subsequent loss under their policy. The loss, having been paid, represented merely a gratuity and not the discharge of an obligation. This being so, the reinsurers were not liable under their policies, since such policies covered only legal liability of the original underwriter. As to the seaworthiness and its admission by the Institute Time Clauses, the court comments as follows:

"It is contended that clause 8 in the Institute Cargo Clauses, which, broadly stated, is a clause saying that seaworthiness is admitted, makes it impossible for the insurers to take the point that the ship was unseaworthy. Mr. Dunlop for the original insurer called it estoppel or an admission of a fact. I think the answer to that is this, that the re-insurance policy is a policy covering, and covering only, the liability of the original insurer. If there is no liability on the original underwriter, then there cannot be any liability on the re-insurer. He further said that if that point was not open to him, still the clause 'pay as may be paid thereon,' made

the reinsurer liable, because in fact the original underwriter had paid and therefore the reinsurer was bound to pay; and he said the original underwriter could waive his right to say the ship was unseaworthy and pay, if he did so honestly and bona-fide. I think the best answer to the waiver point is this, that so far as the evidence goes, the original underwriter here never did waive that point. He does not seem to have known or cared whether the ship was seaworthy or not; and I do not think he could waive a point and extend his own liability without the consent of the re-insurer.

"I think one might quite fairly go on to say that seaworthiness does not mean anything different in the one case or in the other. As I understand it, a contract of re-insurance is a contract to indemnify against a liability and a payment. There must be both liability and payment, and the precise liability must be covered in each case. Clause 8, seaworthiness admitted, does not prevent the re-insurer saying that the original underwriter suffered no loss for which he could be made responsible; he had a complete defence against the assured, the defence of unseaworthiness, and there is no necessity to plead unseaworthiness in this case. The original underwriter was not liable at all, and, if he was not liable, there is nothing for which he can claim over. The contract for re-insurance is on goods limited to the liability of the original underwriter. The re-insurer's liability is limited to the original insurer's liability under the original policy. It is only a different way of saying the same thing. Another way of putting it is to say that the contract of re-insurance properly understood is a contract to indemnify against losses which the original underwriter has suffered, but not against gifts. The payment in this case was a voluntary payment, so far as the original underwriter is concerned; and he did not insure himself for gifts that he might choose to make to his assured. The contract is expressed to be a re-insurance on the same terms as the original policy, to in-

demnify against liability for goods lost, not an insurance of the goods. The re-insurer says to the original underwriter: You have no liability, you have no loss, you have no interest. The Institute Clause as to unseaworthiness only applies if and when the original policy contains it and if and when the original underwriter is liable for unseaworthiness."

So, "to pay as paid" under the original policy means—in England at least—to pay as paid—provided the original insurer was legally liable under his policy to the owner of the thing insured.

MIXED CARGO

The Study Class of the Association of Marine Underwriters of San Francisco, at their meeting of December 12, had the opportunity of hearing speakers on two rather technical subjects.

Theron Prentiss, in the adjusting department of Marsh & McLennan, laid bare the hidden mysteries of the adjustor's dark and devious calling. His comments had to do not so much with the theory of general and particular average as with the routine and practice in the adjustor's office. His summary of the difficulties encountered in even the simplest adjustments will probably have the effect of educating local underwriters to the reasons for numerous delays in completion of current cases.

The second speaker was Clifton R. Gordon, attorney-at-law, who discussed charter-parties. He treated chartering contracts in their various phases opening with a classification of the most ordinary types and continuing to the minute discussion of the clauses involved in the time charters.

The golfing and marine insurance population of San Francisco has recently been increased by the return from New York of Charles A. Hulme, who recently resigned as marine secretary of the Home Insurance Company of New York. Mr. Hulme, who made a host of friends on the Pacific Coast during his connection with the marine field here, has been marine secretary of the Home of New York and its affiliated companies since 1922.

His return here was impelled by considerations of health and a desire to live on the Pacific Coast. Louis F. Burke will succeed Mr. Hulme as general manager of the Home's marine dept. in New York.

American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McINNIS

SOME RECENT SHIPBUILDING CONTRACTS

Lake Washington Shipyards, Hoquiam, Wash., has been awarded a contract from the United States Fish Commission for the construction of a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000.

Burnard Drydock Company, Seattle, Wash., has received an order for the construction of a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000.

Harbor Boat Building Company, San Pedro, Calif., has an order from Frank Acahn of San Pedro for a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000.

Bellingham Marine Railway & Boat Building Co. has started operations at the new plant on Skagitum Creek Waterway, with the keel laying of a 72-foot cannery tender for the Bellingham Canning Co. A.

contract of building a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000.

The Sport Engineering Company, Everett, Wash., has been awarded a contract from the United States Fish Commission for the construction of a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000. The vessel will be powered with a 75-horsepower diesel engine and will cost \$36,000.

Hoffar Boasting Shipyard, Vashon, Wash., has been awarded a contract from the United States Fish Commission for the construction of a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000.

Martinez Boat Building Co., Tacoma, Wash., has an order from Captain O. Hanson of Seattle for the construction of a 75-foot halibut boat to be powered with a 150-horsepower diesel engine.

Detroit Boat and Motor Works, Detroit, Mich., has recently received orders for two wooden yachts. One is for Murray W. Sales of Detroit, to be 89 feet long, 16 ft 9 in. beam, 5 ft draft. She is to be powered with 160-horsepower diesel engines giving a speed of 13 miles an hour. The other yacht is to be of 56 feet length, powered with 100-horsepower gas engines developing a speed of 35 miles. The latter is for T. A. Yawkey of Detroit.

Manitowoc Shipbuilding Corporation, Manitowoc, Wis., has an order from the United States Dredge & Dock Co., for a diesel tug, 114 ft, 6 in. length and 27 ft beam. This yard also has an order from the Fitzsimmons Connell Dredge & Dock Co. for a steam tug, 75 ft length, and a 300-hp motor scow, 100 x 37 feet.

The Harbor Boat Works, Wil-

son, N. H., has been awarded a contract for the construction of 80-foot length for various owners. The first of these, the Costa Rica II has just been delivered to Frank Gargas, San Pedro fisherman, and cost \$30,000.

The Andersons, Seattle, Wash., has been awarded a contract from the United States Fish Commission for the construction of a 76-foot purse seiner and bait boat to be powered with a 75-horsepower diesel engine, and will cost \$36,000.

Great Lakes Engineering Works, River Rouge, Michigan, reports new orders on January 1, 1928, for one auto-ferry and three scows. The auto-ferry is for the State of Michigan, to be 100 ft long, 20 ft wide, 11 ft draft, 100-horsepower triple expansion engine, and two scows. The scows are for the Great Lakes Dredge & Dock Co.; one flat scow, 130 x 32 x 10 ft.; two motor scows, 120 x 42 ft. 6 in. x 10 ft.

Dravo Contracting Co., Pittsburgh, reports new orders as follows: One dipper dredge hull 83 x 30 x 6 ft. for the Monongahela and Ohio Dredging Co.;

Two steel hulls for pile drivers 60 x 26 x 6 ft. 5 in. for Merritt, Chapman & Scott Corp.;

Five steel barges 130 x 34 x 10 ft. for the Hainesport Mining & Transp. Co.;

These orders aggregate 2195 gross tons.

American Bridge Co., Pittsburgh, reports an order for 10 covered barges 175 x 26 x 11 ft. for the Carnegie Steel Co.

J. C. Johnson's Shipyard, Port Blakely, Wn., reports orders for: One cannery tender 76 x 18 x 8 ft. 6 in. for P. E. Harris & Co., Seattle; One cannery scow 72 x 24 x 5 ft. 6 in. for Libby, McNeill & Libby, Seattle.

Nashville Bridge Co., Nashville, Tenn., has new orders for:

Two deck barges 110 x 28 x 7 ft. 3 in.; three deck barges 130x32x8 ft.; three deck barges 180 x 40 x 9 ft. 6 in.; one deck barge 100 x 26 x 6 ft. 6 in.; one motor tug 44 x 9 1/2

x 4 1/2 feet, with 75 H.P. diesel engine.

Howard Shipyards & Dock Co., Jeffersonville, Ind., reports orders for:

Two sand and gravel barges 110 ft. 10 in. x 28 x 7 ft. 3 in. for the Nugent Sand Co., Louisville, Kentucky;

One wharf barge 132 x 30 x 4 ft. 4 in. for the Ohio River Sand Co., Louisville;

One towboat hull 135 feet 6 in. by 26 feet 6 in. by 5 ft. for the Island Creek Coal Co., Cincinnati.

Midland Barge Co., Midland, Pa., reports orders for:

One dredge hull, 150 x 70 x 13 ft. 6 in. for the M. H. Treadwell Co., of New York;

Four steel sand barges, 120 x 30 x 7 ft. 6 in. for E. T. Slider, New Albany, Ind.;

Two steamboat hulls 151 x 34 x 6 ft. 6 in. for Union Barge Line, Pittsburgh.

Charles Ward Engineering Works, Charleston, W. Va., has a 100-horsepower diesel engined stern-wheel river towboat, 64 ft. 9 in. by 18 ft. by 45 inches, building for stock.

SHIPBUILDING WORK IN PROSPECT

Bids Opened on Standard Oil Tanker

The Standard Oil Company (Calif.) opened bids received from American shipyards at its San Francisco headquarters on January 30 for the construction of hull and installation of machinery for an oil tanker to accommodate the diesel-electric machinery already ordered by the company. The tanker will be approximately 500 feet long, 68 feet beam, and 32 feet molded depth, with a carrying capacity of 90,000 barrels of oil. The power plant will consist of Busch-Sulzer diesel engines and Westinghouse electric generators and motors.

Bids were as follows: Newport News Shipbuilding & D.D. Co., \$1,625,000 and 420 days; Sun Shipbuilding Co., \$1,687,000 and 300 days; Bethlehem Shipbuilding Corp., \$1,739,000 and 499 days; Moore Dry Dock Co., \$1,875,000 and 15 months; Los Angeles Shipbuilding Corp., \$1,896,000 and 390 days; American Brown Boveri Electric Corp., \$1,925,000 and 480 days.

Engine Bids Opened

Bids submitted by 11 companies on the auxiliary engines for the next group of eight Shipping Board conversions were opened in Washington recently in the office of Captain R. D. Gatewood, manager of the maintenance and repair division of the Shipping Board. Several alternate propositions were submitted in each case and figures must be analyzed and compared before an award can be made.

The bidders were: Bethlehem Steel Corporation, Busch-Sulzer Diesel Engine Company, C. & G. Cooper Company, De La Vergne

Machine Company, Fairbanks, Morse Company, Fulton Iron Works, Ingersoll-Rand Company, McIntosh & Seymour Corporation, New London Ship & Engine Company, Norberg Manufacturing Company, and Worthington Pump & Machinery Corporation.

Panama Steamship Company Plans Passenger Vessels

The Panama Steamship Company, with offices in New York, has retained naval architects Cox and Stevens of New York to draw up plans and specifications for two passenger ships for its New York-Panama service. It is reported that power will be supplied by geared turbines, steam from Babcock & Wilcox boilers. Auxiliaries will be driven by diesel-electric power.

As these vessels will be operated in semi-tropical waters, many special features for comfort in the passenger accommodations will necessarily be incorporated in the design.

Golden Gate Ferry Company To Expand

The Golden Gate Ferry Company of San Francisco, which operates a fast automobile ferry service on two routes, has laid before the Railroad Commission plans and asked franchise for operation of an automobile and passenger ferry service between San Francisco and Point San Quentin, eight minutes drive from San Rafael, with bus connections for foot passengers. This route would cut off considerable distance of travel in Marin County for travelers to the northern part of the state and would greatly relieve congestion, which is a great inconvenience to the suburban residents.

The Northwestern Pacific Railway, operating automobile service between San Francisco and Sausalito, has subsequently entered a plea for a franchise to operate an automobile ferry service between the Ferry Building, San Francisco, and Point San Quentin.

The Golden Gate Ferry Company's newest diesel-electric ferryboat, the Golden Age, was launched by the General Engineering & Drydock Company, Alameda, on January 21. The vessel is identical to other ferryboats of this company, of 240 feet length, Ingersoll-Rand diesel engines, and Westinghouse generators, motors, and other electrical equipment.

The company plans to build a slip and other terminal facilities at Point San Quentin and to place on the run boats capable of making at least 20 knots an hour and having a capacity of from 90 to 110 cars.

Many Colliers to Burn Pulverized Coal in Prospect

Considerable interest is being manifested on the Atlantic Coast in the successful burning of pulverized coal for boiler fuel, and several coal companies are actively planning the construction of colliers with this type of equipment, expecting to gain considerable economy in fuel costs over other types of fuel.

The Berwind-White Coal Mine Company, 1 Broadway, New York, opened bids on December 22 for two steamers, 391 feet long, 50 feet beam, 23 feet 6 inches loaded draft, 6500 tons deadweight. These are to be propelled by geared turbines developing 3000 shaft horsepower, steam to be supplied by Babcock & Wilcox water-tube boilers. Boilers are to be fitted with pulverized coal burners.

It is reported that the American Brown-Boveri Electric Corporation of Camden is drawing up plans and specifications for two colliers for the Pocahontas Fuel Company of New York, and that the Bethlehem Shipbuilding Corp., Fore River plant, Quincy, Mass., is working on specifications for one collier for the Clinchfield Coal Company of New York.

Ford Motor Company to Convert Freighter

It is reported in the East that the Ford Motor Company is to convert the Lake type freighter Lake Ormoc from steam to diesel power at its own plant. Busch-Sulzer Bros. die-

News from the Shipyards

New Shipyard at Tacoma

The Coast Line Shipbuilding Company has recently been incorporated with a capital stock of \$50,000 at Tacoma, and has taken over an abandoned shipyard near Gallagher's float on the tideflats. The company will build cruisers and other pleasure boats. Incorporators include A. A. Crowcroft, S. A. Perkins, and others.

Pleasure Boat Launched

The United Ship Repair Company, San Francisco, recently launched the motor cruiser Fire Bell, built for Fire Chief Thomas R. Murphy of San Francisco. While the boat was built for pleasure cruising on San Francisco Bay and tributaries, it is equipped with the necessary speed and ruggedness to be used by the chief in directing fire battalions on the waterfront. The boat is 28 feet long and of 55 horsepower, giving a speed of 12 knots.

The Chilean Government has made public a new ship-subsidy bill, which provides for the President of the Republic to expend up to 2,000,000 pesos (\$240,000) annually as subsidies to national companies under certain conditions and to make loans to private companies for acquiring ships for foreign and coastwise trade.

Wm. Cryer & Son, shipbuilders, Oakland, California, are building two more stock cruisers to keep their employees at work until the spring trade opens up.

Captain Fay, Rio Vista, California, is having a new workboat built at F. L. Fulton's Yard, Antioch. This is to replace one recently burned. The new craft will be 65 feet long and will be powered with a 6-cylinder diesel engine of 110-horsepower.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of January 1, 1928

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potero Works, San Francisco

Purchasing Agent: O. W. Street.

Steel dredge hull for U.S. Smelting, Refining & Mining Co., Oakland, Calif.: 128x60x12 ft.; 10 cu. ft. buckets; delivered Nov. 15/27.

Two steel dredge hulls, sisters to above; 148x60x12 ft.; 10 cu. ft. buckets; delivered one Nov. 15/27.

Steel dredge hull, sister to above; 168x60x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above. 100x50x11'4"; 6 cu. ft. buckets; deliver Apr. 1/28 est.

Barge No. 6, hull 5334, steel carfloat for Atchison, Topeka & Santa Fe Railway; 260 L.B.P.; 38 beam; 12'6" loaded draft; keel Sept. 27/27; launched Dec. 12/27; delivered Dec. 21/27.

Waukegan, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 38 beam; 17'4 1/2" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12-268 sq. ft. heating surface; keel Nov. 15/27.

GENERAL ENGINEERING & DRY-DOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Not named, hull 12, diesel-electric wood-en auto ferry for Golden Gate Ferry Co.;

240 L.O.A.; 44 beam; 10'6" loaded draft; 3 400 H.P. Ingersoll-Rand diesel engs.; Westinghouse 950 S.H.P. motors; keel Oct. 25/27 est.; deliver March 1/28 est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x36x11 ft.; launched Oct. 5/27.

Crane, hull 125, patrol boat for U.S. Bureau of Fisheries, Seattle; 90 L.B.P.; 20 beam; 13'5" loaded draft; 200 H.P. Washington-Estep diesel engs.

Northern Light, hull 134, twin screw cannery tender for Northern Light Packing Co., Cordova, Alaska; 55 L.B.P., 13 beam.

Hull 135, fish scow for Alitak Packing Co., Seattle; 55 by 18 by 4 ft.

Hull 136, same as above.

Hull 137, fish scow for P. E. Harris & Co., Seattle; 60' long by 16' beam.

Hull 138, same as above.

Hull 139, pot scow for P. E. Harris & Co. 28'x10'x2'10"

Hull 140, same as above.

Hull 141, cannery tender for P. E. Harris & Co., Seattle 76'x18' x8'6".

Hull 142, scow for Libby, McNeill & Libby, Seattle; 72'x24'x5'6".

PACIFIC COAST ENGINEERING CO., Oakland, Calif.

Alki, hull No. 4, fireboat for City of Seattle; 123 L.O.A.; 26 moulded beam, 76" draft; 14 knots speed; seven 6-cyl. 300-H.P. Winton diesel engs.; keel July 7/27; launched Nov. 5/27; delivered Jan. 10/28.

PRINCE RUPERT DRYDOCK & SHIPYARD,

Prince Rupert, B.C.

One pile drive scow for Pacific Stevedor-

ing Co.; 60x20 ft.; delivered Dec. 22/27.

One halibut fishing boat for John Ivarsen, 58'x14'6"x6'4"; 60 H.P. Fairbanks-Morse semi-diesel eng.; keel Dec. 19/27.

One halibut fishing boat for Hans Underdahl, 58'x14'6"x6'4"; keel Dec. 19/27.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penna.

Purchasing Agent: W. G. A. Millar.

Twelve barges for Tennessee Coal, Iron and Railway Co., Birmingham, Ala.; 140x25x11ft.; 8 delivered.

Ten covered barges for Carnegie Steel Co.; 175'x26'x11'.

AMERICAN BROWN-BOVERI ELECTRIC CORP.,

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

Hull 373, cement barge for International Cement Corp.; 163'x6'x37'4"x13"; keel Oct. 1/27; launch and deliver Dec./27.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 H.P. triple expansion engs., 2 Scotch boilers, 15'x4 1/2'x11'6"x180 lbs. pressure; keel Aug. 29/27.

Not named, hull 803, motor tanker for F. C. Wright; 334 feet L.B.P.; 51 feet beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,

Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25.

No. 45, electric cutter for U. S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, diesel-electric freighter for Middlesex Transportation Co., New Brunswick, N.J.; 131 x 31 x 11 ft.; Winton-General Electric machinery; electric auxiliaries; 12 mi. speed.

Not named, steel passenger and freight steamer for the New England Steamship Company, Newport, R.I.; 202 L.B.P.; 36 moulded beam; 14'6" moulded draft; 1082 gross tons; 4 cyl. T.E. eng.; B. & W. boilers, coal burning.

Not named, steel passenger and freight steamship for the Pennsylvania Railroad Co., West Philadelphia; 300 ft. length; T.E. engs.

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vents Leakage of Pump.

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DEER BOAT & MOTOR WORKS

The City, Mich.

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DRAYO CONTRACTING COMPANY

Pittsburgh, Pa.

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FEDERAL SHIPBUILDING & DRY DOCK COMPANY

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GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

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HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

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GEO. ROEMERS, Secretary-Treasurer

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Nugent Sand Co., Louisville, Ky.; 110' 10" x 28' x 3" depth.

Hull 1639, sand and gravel barge same as above.

Hull 1640, wharf barge for Ohio River Sand Co., Louisville, Ky.; 132' x 30' x 4' 4".
Hull 1641, towboat hull for Island Creek Coal Co., Cincinnati; 135' 6" x 26' 6" x 5'.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hulls 235 and 236, two dump scows for Great Lakes Dredge & Dock Co., Chicago; 223' x 42' 4" x 15'; keel Dec. 1/27.

Hulls 237 and 238, two barges for U.S. Engineers, Milwaukee; 80 x 26 x 5 ft.; Ellis Channel steel hull construction.

Hull 239, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 100 x 37 x 6'.

Hull 240, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 120 x 30 x 7'.

Hull 241, diesel tug for Great Lakes Dredge & Dock Co.; 114' 6" L.B.P.; 27' beam.

Hull 242, steam tug for Fitzsimmons Connell Dredge & Dock Co.; 75' x 16'.

Hull 243, 800-yd. dump scow, for Fitzsimmons Connell Dredge & Dock Co.; 136 x 37 ft.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Stern-wheel towboat for Magdalena River, Colombia; 168 x 42 x 5 ft.; keel Aug. 4/27; launched Nov. 5/27; deliver Jan. 20/28 est.

Stern wheel tugboat for Magdalena River, Colombia; 173 x 44 x 5 ft. 6 in.; keel Sept. 1/27; launch Jan. 30/28 est.

Stern wheel towboat for Magdalena River, Colombia; 168 x 42 x 5 ft.; keel Nov. 8/27; launch Mar. 1/28 est.

Twenty steel hopped cargo barges for Magdalena River, Colombia; 125 x 26 x 6 ft.; launch first Jan. 20/28 est.

MIDLAND BARGE COMPANY

Midland, Pa.

One steel flush deck barge for Dillman Egg Case Co.; 180 x 36 x 7 ft.

Five barges for Inland Waterways Corp., 126' x 33' x 7' 6".

Not named, towboat for E. T. Slider, New Albany, Ind.; 145 x 32 x 5 ft. 6 in.; keel March 1/28 est.

One barge for Anaconda Copper Mining Co.; 115 x 34 x 10 ft.; keel Nov. 15/27.

One dredge hull for M. H. Treddwell Co. of New York; 150' x 70' x 13' 6".

Four steel sand barges for E. T. Slider, New Albany, Ind.; 120' x 30' x 7' 6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151' x 34' x 6'.

One barge for Acme Construction Co.; 77 x 22 x 4 ft.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo E. Wege.

Hull 132, deck barge, for stock; 100 L.B.P.; 24 beam; 5' loaded draft; keel Aug. 25/27; delivered Nov. 4/27.

Hull 133, deck barge for stock; 160 x 39 x 7 ft.; delivered Nov. 17/27.

Hull 134, deck barge, for stock; 100 x

24 x 5 ft.; keel Oct. 15/27; launched Dec. 1/27; delivered Dec. 1/27.

Hull 135, deck barge for stock; 100 x 24 x 5 ft.; keel Oct. 25/27; delivered Dec. 1/27.

Hull 136, deck barge for stock; 110' x 28' x 7' 3".

Hull 137, same as above.

Hull 138, deck barge for stock; 130' x 32' x 8'.

Hull 139, same as above.

Hull 140, same as above.

Hull 141, deck barge for stock; 100' x 26' x 6'.

Hull 142, tug for stock; 44' x 9' 6" x 4' 3"; 75 H.P. diesel eng.

Hull 143, deck barge for stock; 180' x 40' x 9' 6".

Hull 144, same as above.

Hull 145, same as above.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

California, hull 315, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gro. tons; 17,000 I.H.P.; keel Mar. 20/26; launched Oct. 1/27; deliver Jan. 14/28 est.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel Apr. /28 est.; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launch Mar. /28 est.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613' 3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27.

W. J. Harahan, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14' 6" depth; one screw; T.E. eng.; Scotch boiler; coal burning; keel Jan./28 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

Savarona, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect, New York; 294' L.O.A.; 38' 3" beam; 16' loaded draft; 2 Bessemer diesel engs.; total of 3000 H.P.; keel Apr. 1/27; launched Sept. 12/27; deliver Jan. 15/28 est.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56' 6" beam; 15' 6" loaded draft aft; 18 1/2 m. speed; 1784 gross tons 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13' 8" diameter; keel Sept. 20/27; launch Feb. 6/28 est.; deliver July 1/28 est.

Not named, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139' 9" L.W.L.; 22 beam; 7' 6" loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600

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U. S. NAVY YARD
Bremerton, Wash.

VICTORIA MACHINERY DEPOT CO.
Victoria, B.C.

show, boiler repairs), str. Princess Ma-

Trade and Traffic Trends

Foreign Trade Club of California Elects Officers

THE executive committee of the Foreign Trade Club of California, at a meeting on January 23 outlined plans for expanded activity for the coming year and elected officers to direct the program. William G. Marvin was elected president; Charles L. Wheeler, of the McCormick Steamship Company, first vice-president; H. M. Huff, of the United Fruit Company, second vice-president; and Wesley O. Ash, of the United States Bureau of Foreign and Domestic Commerce, third vice-president. William D'Egilbert is managing director. A unanimous vote of thanks was extended to E. W. Wilson and Harry S. Scott, re-

tiring president and first vice-president, for their services in upbuilding the port of San Francisco through their leadership in the Foreign Trade Club.

The newly elected executive committee of the Foreign Trade Club, besides the officers, consists of Wallace, I. Atherton, Aubrey Drury, H. K. Faye, Hugh Gallagher, C. Parker Holt, Walter E. Hettman, Percy R. Mott, Fred D. Parr, John C. Rohlf, Harry S. Scott, and George S. Williams. The advisory committee of past presidents consists of C. E. Hydes, E. W. Wilson, W. H. Hammer, J. G. Decatur, Harry Glensor, and C. A. Maydwell.

William G. Marvin, New President of Foreign Trade Club of California

WILLIAM G. MARVIN, unanimously elected president of the Foreign Trade Club of California for the year 1928, is recognized as a leader in world trade and international affairs. He is the head of the firm of Marvin & Bergh, international lawyers, with offices in the main cities of the world, including New York, San Francisco, London, Paris, Havana, and Buenos Aires. Marvin is managing director of the American Manufacturers' Foreign Credit Insurance Exchange, with a membership of several thousand of the leading manufacturers in the United States conducting an export business.

Graduating from the University of California in 1914, Marvin began the practice of the law. Entering the army as a private during the World War, he rose to the rank of captain in the Air Service. After the war, he became head of the Legal Department of the National City Bank, New York, and in 1921 organized his own firm, engaging in international law. He is chairman of the Legal Advisory Committee, Division of Commercial Laws, United States Department of Commerce; general counsel of the American Chamber of Commerce in London; American Counsel of the American Chamber of Commerce in Germany and also in Cuba, and he has served as president of the American-Rus-



William G. Marvin, president-elect, Foreign Trade Club of California.

sian Chamber of Commerce, New York. He is chairman of the Hague Rules Committee of the International Law Association. Recently he attended the International Disarmament Conference in Geneva, and is now present at Havana at the Pan-American Conference in the official capacity of counsel of the Caribbean Section.

Marvin is author of the book, "The Defensive Side of Banking," and many articles in magazines and

brochures on world trade. He is known as one of the most eloquent speakers discussing topics on international affairs, which he views from the standpoint of a practical business man.

The new president of the Foreign Trade Club has been a member of the organization since 1923. He first appeared before the organization in 1920, when he attended the National Foreign Trade Council in San Francisco.

On Monday, March 5, on his return from the Pan-American Conference in Havana, Marvin is to give a review on the trade aspects of the Pan-American movement as revealed at the Conference, and will outline a program of activity for the Foreign Trade Club in 1928. "This is the year of opportunity for San Francisco," he declares. "The Foreign Trade Club is in a position to aid greatly in making the most of the situation which now presents itself in the field of world trade. It is the plan of this energetic organization to enter aggressively upon a program of expansion so as to aid to the utmost in the upbuilding of the prosperity of all California and all the West."

New Orleans Canal Busy

A LARGE increase in the use of the Inner Harbor Navigation Canal which connects Mississippi River with Lake Pontchartrain and the tidal outlets to the Gulf of Mexico is reported by the Board of Commissioners of the Port of New Orleans for the calendar year 1927. Transits in 1927 amounted to 9577 vessels of 3,680,356 gross register tons—tolls being based on gross tonnage. This compares with a total of 7574 vessels of 3,153,325 gross register tons in 1926.

The greatest number of transits for any one month was 1106, in August, but the largest tonnage occurred in October, transits aggregating 355,968 tons for that month. The traffic remains practically constant throughout the year, however, being about 800 vessels for each month and approximately 300,000 gross register tons.

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A Notable Banquet

By J. S. Hines

THE annual dinner of the Philadelphia Traffic Club is always an interesting event. Held this year on January 10 at the Bellevue-Stratford with 2000 sitting at dinner, this banquet took on international interest since Sir Henry W. Thornton, chairman and president of the Canadian National Railways, was guest of honor and principal speaker.

Sitting shoulder to shoulder with Sir Henry was Hon. Harry A. Mackey, mayor of Philadelphia, and these two were continuously interchanging reminiscences of their collegiate days at the University of Pennsylvania, where, in 1893, Mackey captained a famous football team upon which Thornton was an outstanding performer.

Sir Henry Thornton is a native of Indiana, educated in Pennsylvania, and came to fame as a Canadian Railway executive. His achievements have been the favorite argument of American affirmative debaters on the government ownership question. In his speech he spiked the guns of these debaters as follows:

"Those who favor and those who oppose government railroad ownership have been drawing their own favorite conclusions from the Canadian National Railways too long now," Sir Henry said. "As a matter of fact, our success carries no example to any other country because of the circumstances leading to our government ownership and other circumstances peculiar to Canada.

"Two railroad systems were taken over by our government and merged into the Canadian National Railways when bankruptcy threatened receiverships after the government had invested largely in them in the form of subsidies. There seemed no other way out, so the government acquired all the stock and then removed the system from politics by placing it in the hands of a board of directors.

"It has been successful. Its net earnings increased from \$3,000,000 in 1922 to \$46,000,000 in 1926. But it has been kept out of politics and will stay out of politics so long as I remain its chairman."

Sir Henry's theme was "Leadership" and he stressed this attribute very forcibly in his talk. He desired

to have in every department of any railroad and in every employe in the department an aspiration for leadership in getting under the responsibilities of the department. It was a strong, pithy speech, and was well received by the great gathering.

Elisha Lee, vice-president of the Pennsylvania Railroad, made a very happy and snappy toastmaster. Other speakers on the program were: Hon. J. A. Emery, general counsel of the National Association of Manufacturers, and John L. Davis, A.B., B.D., D.D. Music was furnished by the Temple Glee Club of Philadelphia and by the Pennsylvania Railroad Altoona Works Band. Among those seated at the guests' table were:

W. W. Collpitts, representative National City Bank and Kuhn, Loeb Co.; L. C. Sprague, vice-president and general manager, Uintah Railway; F. H. Clark, R. R. Advisory Board, Government of China; R. B. White, president, Central Railway of New Jersey; L. W. Baldwin, president, Missouri Pacific Railroad; S. M. Vauclain, president, Baldwin Locomotive Works; A. T. Dice, president, Reading Company; J. P. Brown, president, Philadelphia Traffic Club, traffic manager, Barber Asphalt Company; Sir Henry W. Thornton, K.B.E.; Hon. Harry A. Mackey, mayor, City of Philadelphia; W. W. Atterbury, presi-

dent, Pennsylvania Railroad; F. J. Thiel, assistant treasurer of the United States of America; and E. E. Loomis, president, Lehigh Valley Railroad; W. G. Vollmer, assistant to president, Missouri Pacific Railroad; F. H. Hammill, former vice-president, C. R. I. & P. R. R.; and J. S. Hines, publisher, Pacific Marine Review; G. S. Ross, asst. vice-pres., N.Y.C. & St. L. R.R.; Geo. Morton, asst. freight traffic mgr., C. B. & Q. R.R.; J. A. Lucy, traffic mgr., M & St. L. R.R.; E. R. Bardgett, pres., Traffic Club of New York; C. A. Blood, traffic mgr., Lehigh Valley R.R.; H. G. Holden, asst. freight traffic mgr., Wabash R.R.; Chas. Heebner, general counsel, Reading Co.; J. B. Large, general traffic mgr., Pennsylvania R.R.; E. D. Hilleary, vice-pres., Reading Co.; J. L. Eysmans, vice-pres., Pennsylvania R.R.; Dr. John L. Davis, A.B., B.D., D.D.; Hon. J. A. Emery, general counsel, National Asso. Manufacturers of U.S.; Elisha Lee, toastmaster, vice-pres., Pennsylvania R.R.; C. E. Eytting, pres., Universal Car Loading Co.; C. B. Sudborough, assistant vice-pres. Pennsylvania R.R.; C. H. Ewing, vice-pres., Reading Co.; E. R. Riter, secr., The General Asphalt Co.; S. A. Allen, freight traffic mgr., B. & O. R.R.; E. H. Alden, vice-pres., Norfolk & Western R.R.; W. J. Mullin, general traffic Mgr., Delaware & Hudson R.R.; A. R. Gould, asst. freight traffic mgr., C. & N.W. R.R.; A. P. Gilbert, freight traffic mgr., C. & O. R.R.

Writers Seek Sea Air

FOUR months' cruise around South America, interspersed with short jaunts ashore, returning via the Panama Canal—this is the program now being carried out by two noted Pacific Coast writers, James Stevens of Tacoma and Albert Richard Wetjen of Salem, on the Pacific-Argentine-Brazil liner West Mahwah, operated by McCormick Company.

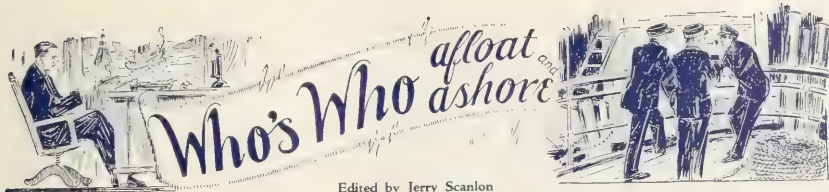
The two writers are not entirely vacation bent, as both have contracted to write books on the voyage and both expect to sandwich in enough time to turn out some shorter fiction.

Stevens, who entered the literary field from the Northwest logging camps, is particularly interested in the development of markets for Douglas fir in South America from

an academic standpoint. He has a love for the timber which he helped on its way to the sawmills for many years. He has planned an excursion into the interior of The Argentine, where many American cattlemen are developing vast estates similar to those of Texas in the boom days of the cattle barons.

Wetjen is nationally known and has a reputation in England for his sea stories. He will specialize on the sea tang of the voyage, Stevens says, and in Captain O. Belleson, veteran skipper of The West Mahwah, he will find an inexhaustible source of information.

McCormick officials arranged a complimentary luncheon at San Francisco on January 19 for the two authors, where a rousing send-off was given them.



James Bullock, port engineer of the Dollar Steamship Line at San Francisco, who served as vice-president during 1927 for the American Society of Marine Engineers, was unanimously elected president of the organization for the ensuing year at the annual election of officers. Other officers elected were: Robert Hill, port superintendent of the McCormick Steamship Company, vice-president; Joseph Barker, port engineer, Matson Navigation Company, was re-elected treasurer.

The officers elected or re-elected to the executive council were: Benjamin S. Free, port engineer for various steamship companies; Henry F. Gelhaus, superintendent engineer for Swayne & Hoyt, past President; James A. Cronin, superintendent engineer for the Standard Oil Company of California; Ray C. Jones, assistant marine superintendent for the General Petroleum Corporation; George Armes, president of the General Engineering & Drydock Company; Charles L. Grundell, marine superintendent, Charles C. Moore & Co.; John Young, port engineer, Charles Nelson Company; Edward R. Brady, president, Eureka Boiler Works; Albert O. Pegg, superintendent engineer, Union Oil Company; Stephen Lindo, marine superintendent, Los Angeles Steamship Co., and Millard R. Hickman, superintendent engineer, Matson Navigation Company. The Board of Trustees is composed of Samuel Taylor, assistant superintendent engineer, Swayne & Hoyt; Edward T. Senter, port engineer, W. R. Grace & Company; and Merrill C. Johnson, port engineer, Panama Mail Steamship Company.

Functioning of the Pacific Coast headquarters of the United States Intercoastal Conference is now in full swing, under the efficient directorship of H. M. Runyon, assistant to Robert C. Thackara, general chairman. The headquarters have been established at 24 California Street, San Francisco. Mr. Runyon said:

"The object of the establishment of a Pacific Coast office in charge



H. M. Runyon, in charge of Pacific Coast headquarters, United States Intercoastal Conference.

of a representative of the chairman of the conference is for the purpose of helping the shippers as well as aiding the steamship lines. There are many problems that come up among the shippers as well as the steamship lines, and these matters can be better and more amicably solved by having a representative of the chairman on the ground. It shall be my effort to cooperate with the shipper and steamship company to help both iron out any problems that may confront them. I shall make it a business to meet as often as possible with all shippers and steamship operators from one end of the West Coast of the United States to the other, and I hope by personal contact with all concerned that all problems vital to the conference may be adjusted. The shipper needs the conference and the conference needs the shipper, and my duties shall be to work to the mutual satisfaction of every one concerned."

Determined to make the Rail and Water Club the leading organization of its kind on the Pacific Coast,

V. B. Windle of the Dollar Line in Los Angeles, president of the organization, working with chairmen of various committees, has outlined a campaign to secure more than a thousand new members this year. More than one thousand announcements of the aims and ideals of the Water and Rail Club have been mailed to interested parties and traffic managers and general managers of transportation companies, and industrial houses are being urged to select one of their officials to become a member of this fast growing educational and beneficial transportation organization.

Ralph Berger, of the California & Eastern Steamship Company, is chairman of the membership committee. Herbert Gridley, vice-president of the Rail & Water Club, connected with the Luckenbach Steamship Company, is in charge of arrangements for speakers for the ensuing year. I. Morgan, of the McCormick Steamship Company, and a director of the Rail and Water Club, is chairman of the house committee.

William Young, well-known marine engineer, is back in San Francisco on vacation, following an absence on the Atlantic Coast, where he served aboard the Leviathan and the President Roosevelt. Young came overland and made several trips on the freighter West Keats, when he was forced to remain shore-side due to illness. Young served on vessels of the old Pacific Mail as chief engineer, notably on the liners San Juan and City of Para. He arrived in San Francisco after a visit to his parents in Los Angeles.

Among the prominent Pacific Coast shipping executives who will be present in Washington when bids for the purchase of government tonnage will be opened on February 10 will be Roger D. Lapham, president of the American-Hawaiian Steamship Company. The American-Hawaiian has been prominently mentioned as one of the strong contenders for purchase of the American - Australia - Orient

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PLEASE MENTION PACIFIC MARINE REVIEW

Line, in conjunction with the Matson Navigation Company.

Three well-known West Coast shipping men were named as representatives of the Pacific Coast to confer with other maritime executives regarding Shipping Board legislation providing for the future of the American merchant marine. The trio are R. Stanley Dollar, vice-president and general manager of the Dollar Line; Captain Walter J. Peterson, manager of the Pacific American Steamship Association and Shipowners Asso. of the Pacific Coast; and J. H. McLafferty, Washington representative of the two steamship organizations and one-time member of Congress from Oakland. All three are now in Washington.

R. Stanley Dollar, vice-president and general manager of the Dollar Line, emphatically denied a report that his company was a member of a gigantic organization that had combined to establish a fund of \$8,000,000 to be used as a bid for the purchase of thirty-seven Shipping Board freighters. The report of the proposed combine gained wide circulation, following a report received from the Far East to this effect.

J. T. Lykes is the newly-elected president of the United States Ship Operators' Association. Other officers elected are: E. S. Trosdal, president of the South Atlantic S.S. Co., and C. D. Mallory of C. D. Mallory & Co., vice-presidents; L. Hudson of the Cosmopolitan Line, secretary-treasurer. The board of governors, re-elected for three years, consists of J. T. Sykes, J. Barstow Small, C. H. Potter, and L. Hudson.

The regular monthly meeting of the Oakland Traffic Club was held at the Leamington Hotel on the evening of January 17, at which time about 75 or 80 members and visitors were present. The speakers of the evening were:

James A. Quinby, of the law firm of Derby, Sharp, Quinby and Tweed, discussing the new uniform bill of lading;

H. M. Runyon, the newly appointed Pacific Coast representative of the Intercoastal Conference, discussing the functions of that conference; and Ross Bray, president of the Pacific Traffic Association, accompanied by Harry Marsh, chairman of the Speakers and Papers

Committee of the Pacific Traffic Association, who gave a very interesting talk on the convention of the Associated Traffic Clubs of America to be held in San Francisco this year.



Herbert M. Thomas, general passenger agent, Matson Navigation Company.

The enthusiasm shown at these meetings is very gratifying to the officers and members of the club.

Charles B. Hopper, Chicago general agent for the American-Hawaiian Steamship Company, is on an inspection tour of the Pacific Coast and to confer with executives of the company.

Williams, Dimond & Company, San Francisco, has been appointed agents for the Bruusgaard Line, a Norwegian steamship company, operating between Havre, Bremen, and Cork to the Pacific Coast. The Los Angeles representative is Captain A. R. Paulsen.

After an inspection tour of Central American offices and agencies, C. C. Mallory, assistant general manager of the Panama Mail Line, is expected to return to San Francisco the end of this month.

Joseph J. Yates, superintendent of all lighthouses for the United States Government along the New England Coast, made an inspection tour of Pacific Coast aids to shipping late last month. This was the first visit of Captain Yates to the Pacific Coast since 1905, when he brought the lightship Blunts Reef from the East Coast via the Strait of Magellan for service on the Pacific. The trip required 115 days.

John W. Chapman, widely-known Pacific Coast shipping executive, has deserted San Francisco to assume directorship of the Dimon Line, recently inaugurated inter-coastal service, with headquarters in New York. Chapman had, prior to going East, represented the Dimon interests on the Pacific coast for many years. He operated the electric-driven passenger vessel Cuba in the San Francisco-Portland service for Dimon for some time, until the vessel was withdrawn from the coast trade and sent back to the Atlantic. Chapman was for many years Pacific Coast manager of the Williams Line. A Pacific Coast manager for the Dimon Line will be appointed early this month, according to Eastern advices.

The commodore flag of Captain Sir James Charles, master of the Cunard liner Aquitania, was hauled down when the crack transatlantic carrier arrived at Southampton. Captain Charles left the ship at the English port for retirement. He is one of the best known navigators on the Atlantic and is known to mariners and thousands of travelers in all parts of the world. Captain Charles will make his home in England.

The 1928 destinies of the Portland Steamship Operators' Association will be directed by George Clarke, of Lidell & Clarke, who succeeded Hillman Lueddemann. Edward Coates, district manager of the Walker-Ross Company, was named vice-president, and C. E. Johnson, of the American-Hawaiian staff, was named secretary-treasurer.

Alan Bancroft, who was at one time associated with the McCormick Steamship Company in Portland, has joined the Nelson Steamship Company.

The Board of Directors of the Matson Navigation Company, in recognition of the efforts of Herbert M. Thomas in promotion of passenger business to the South Seas and Australia, appointed him general passenger agent of the Matson Navigation Company.

Thomas joined the Matson organization a little more than a year ago, along with Hugh Gallagher, now assistant general manager, and M. J. Croyley, when the Oceanic

120 Market Street

Line was purchased. News of Mr. Thomas' appointment was received with gratification by hundreds of his friends in all parts of the United States. His long career in the steamship passenger business with the old Pacific Mail and the China Mail Steamship companies has gained him the friendship and acquaintance of thousands of travel executives and travelers in all parts of the world.

Edwards & Vickery, well-known travel operators, will move from their headquarters in the Hobart Building, San Francisco, to their new offices, 29 Geary street on February 11.

Captain James P. Rasmussen, port captain of the Matson Navigation Company at Honolulu, spent several weeks visiting on the Pacific Coast, renewing acquaintance with old friends. He was accompanied by his wife and three children. Captain Rasmussen sailed in and out of Pacific Coast ports in various commands for many years, prior to assuming his shore-side berth in Hawaii for Matson.

The crack Hawaiian liner Malolo has the only woman hostess on a transpacific passenger carrier. The appointment of Mrs. Gertrude Hayes Hopewell as hostess in charge of entertainment and other features was carried out on the liner. She is being assisted in arranging social activities by Jack Fishbeck, who has served on various Matson liners as purser.

Captain J. H. Trask, veteran master, will be on the bridge of the Matson South Seas liner Sierra when the vessel sails for the Antipodes the middle of this month. Captain Trask has fully recovered from a serious illness that confined him to an Eastbay hospital in December and early last month.

Chief Officer M. J. Bulger, son of United States Inspector of Hulls and Boilers John K. Bulger, took the Sierra as far as Honolulu, where he surrendered command to Captain Thomas J. McManus, first officer of the Sonoma, senior chief officer of Matson Australian ships.

Skipper Lester Hansen of the freighter Mana is fully recovered from an illness that forced him to leave his ship in Honolulu and enter a hospital. He returned a passenger on the Malolo.



James Rasmussen, port captain at Honolulu for the Matson Navigation Company, with his family.

Promotion of Captain E. R. Johanson from the freighter Manulani to the bridge of the passenger carrier Manoa has been announced. Commander "Kan" Hubennette was elevated to the captaincy of the Wilhelmina from the Manoa, and Skipper L. J. Hall was assigned from the Wilhelmina to the Matsonia.

Following the discharge of the Los Angeles Steamship Co.'s liner Yale from the drydock at the Los Angeles Shipbuilding and Drydock Corp., her sister Harvard went on the dock to undergo annual overhauling, hull and boiler inspection, and repainting and redecorating. The Harvard will be discharged from drydock February 11, and will start on regular schedule in conjunction with the Yale.

Condolence was extended to William P. Roth, president of the Matson Navigation Company, by hundreds of friends upon the passing of his brother, Henry Roth, in Honolulu. The deceased resided in Honolulu most of his life.



James Smith, chief engineer of the Panama Mail liner Ecuador, with his two sons, James Jr. and Clarence.

After several years' illness, Edward L. Fauss, chief accountant of the Matson Navigation Company and widely-known in steamship circles, died at his home in Petaluma. Mr. Fauss, one of the most popular officials of the Matson Line, had performed his duties right up until the day before his passing. Mr. Fauss, 58 years of age, joined the Matson Company in 1918. He is survived by his widow. There were no children.

Another member of the Matson Navigation Company has joined the ranks of the benedicts. G. H. Nelson, connected with the Chicago office, took unto himself a bride, Miss Blanche Brucker.

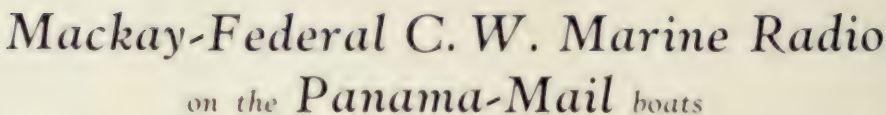
The San Francisco office is also losing one of the most popular young ladies in the organization. Miss Beatrice Howard, assistant to Arthur Bixby, publicity director, will be married this summer to Samuel W. Kephart, engineer, connected with the Pacific Telephone and Telegraph Company.

Word from New York reports that Robert J. Kilby, well-known in San Francisco shipping circles, was seriously ill in a New York hospital.

Mr. Kilby was connected with the San Francisco office of the Java-Pacific Line several years ago.

The "Lamp," organ of the Standard Oil Company, reports that on December 1, 1927, there were 1173 tankers afloat throughout the world, with an aggregate of 9,271,581 deadweight tons. Of this number 402 vessels of 3,756,076 tons were of American register. Of the present world's fleet about 14 per cent are motor driven, compared with 3 per cent in 1913. Only 30 of the present American vessels, with 173,000 tonnage, are motor driven. The Standard Oil Company on December 1 had in operation 96 vessels, aggregating 1,025,115 deadweight tons, of which 38 vessels of 481,065 tons are under the American flag.

The American Pioneer Line freighter Stanley, Captain Longbottom, entered Los Angeles harbor with her flag at half-mast. Captain Longbottom reported that First Officer Samuel Mitchell, well-known in Atlantic and Pacific Coast shipping circles, had been washed overboard during a heavy gale fourteen hundred miles off-



The District Manager, management officer of Mackay Federal C.W. Murray Public Transport, has been unable to overcome the natural communication difficulties met on intercoastal travel, although it was noted that the local bus line and the complications of intervening land. Reliable consistent communication was sought and offered by the specialist at the noted Mackay Federal Area.

and we create ships other than our own, to avail themselves of this service. Now

(1928 Prices are Lower on the New Kolster Radio Compass)
Send Your Name and address with details with pictures and new price list.

shore. Chief Officer Mitchell was directing the crew to batten hatches when a giant wave hurled him into the sea. A lifebuoy was thrown to the helpless officer, but he had disappeared.

William A. Geary is now chief wharfinger of San Francisco's entire waterfront. He was appointed following the passing of William Mackintosh.

Advices from the East Coast state that the Radio Corporation of America has taken over the Independent Wireless Telegraph Company on the Atlantic Coast and converted the former's marine department into a separate concern known as the Radiomarine Corporation of America. It will service with radio 1500 ships, 400 of which were served by the absorbed company.

Hundreds of men who go down to the sea in ships learned with regret of the death of Captain Albert Pelle, master of the Union Oil Company's barge Santa Paula. Captain Pelle was debarking from his ship when he suffered from a heart attack, and fell down the gangway. He succumbed shortly after. Captain Pelle, a resident of Oakland for forty years, has followed the sea all his life. He is survived by his widow and two daughters.

Chief Officer Howard E. Wallaston of the Dollar transpacific liner President Lincoln has returned to his ship after a honeymoon tour with his bride, the former Mrs. Marian Jasper of Oakland. The couple were married in Reno.

A comprehensive survey of Pacific Coast shipping has just been completed by Henry Schuengel, general manager in the United States and Canada for the North German Lloyd. He was accompanied on his tour by Paul Nolze, Pacific Coast manager.

Second Steward George Blanco of the liner Ecuador is, perhaps, the only seagoing officer sailing the Pacific whose ideas of a mascot for a ship leans towards tigers. At any rate, "Chopo," a Nicaraguan baby tiger, is at present the mascot of the Ecuador. Captain Curt Zastrow stated that it was all right with him as long as Mr. Blanco was sure that he could handle "Chopo." However, for the present "Chopo" is at an age where he is quite harmless.



George Blanco, second steward of the Ecuador, and his pet tiger kitten "Chopo."

Captain Emil Francke, widely-known Pacific Coast ship master, has fully recovered from a six months illness. Captain Francke was on 'Change visiting old friends. He is making his home in San Francisco with Mrs. Francke. Captain Francke's son, Al, who followed the sea for many years with the old Pacific Mail and Panama Mail Line, has joined the foreign independent travel bureau of the American Express Company.

The disposal of three more of the cargo carriers of the Dollar Steamship Company was made known by the San Francisco office of the company, which announced the Canadian American Steamship Company, Ltd., Vancouver, as purchasers. The big freighters are the Robert Dollar, M. S. Dollar, and Esther Dollar.



Captain Conrad "Kam" Hubbenette, recently appointed skipper of the Wilhelmina.

Captain John Ross, who recently resigned as skipper of the freighter West Niger of the Oregon-Oriental Line, plans a trip to Australia, after visiting ship mates in California this month.

V. A. Stout, formerly connected with the Worthington Pump and Machinery Company as Pacific Coast diesel engineer, has severed affiliations and is now established in his own offices in the Five Building as representative of the Bessemer Gas Engine Company of Grove City, Pennsylvania.

C. Corrigan was elected president of the Vancouver branch of the National Association of Marine Engineers of Canada, Inc., for 1928. E. Read was re-elected secretary-treasurer, a position he has held for the last eighteen years.

After serving for seventeen years as manager of the Vancouver office of Balfour, Guthrie & Co., T. W. B. London, well-known shipping man, has retired. He is succeeded by R. E. Lewin of the San Francisco offices. Mr. London plans a ten months tour of Europe.

James Tyson, vice-president and general manager of the Charles Nelson Company, is in Washington. He will be present during the opening of bids for the purchase of the Shipping Board freighters now operating in Pacific trade.

G. N. Scott, formerly assistant manager of the Canadian Transport Company, Ltd., Vancouver, has resigned to join the Seattle staff of H. F. Ostrander & Co.

Charles Saunders, son of Captain C. W. Saunders, is a chip of the "old block." Young Saunders is now mounting the ladder in the footsteps of his father, who is superintendent of the Matson Navigation Company. The "youngster" is now fourth officer aboard the liner Manoa.

J. Dal Paiz, president of the French Line, plans a visit to the Pacific Coast this year on an extensive survey, according to Captain B. Aillet, Pacific Coast manager for the French Line, who is back from a business trip to the Atlantic Coast.



Four Days to Hawaii On the New Malolo!

7

The new Malolo, a 10,000-ton liner, is the fastest ship in the world. She is the only ship in the world that can make the run from San Francisco to Hawaii in four days. She is the only ship in the world that can make the run from San Francisco to Hawaii in four days. She is the only ship in the world that can make the run from San Francisco to Hawaii in four days.

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IN FOG - BLOW FOUR WHISTLES
WHEN CLEAR - BURN BLUE LIGHT OR JACK AT FORECAST

Freights, Charters, Sales

January 16, 1928.

THE following fixtures are reported for grain to the United Kingdom: British str. Swainby, Vancouver to U. K.-Continent, Jan. loading; British str. Troutpool, same, Jas. Stewart Grain Corp.; British str. Teespool, same; Japanese str. Yone Maru, Portland to U. K.-Continent, Jan., Strauss & Co.; British str. Homer City, Vancouver to U. K. - Continent, 32/-, Jan.; British str. Dalveen, same, Balfour Guthrie & Co.; Japanese str. Karachi Maru, same, 34/-, Johnson Walton & Co.; British m.s. King Edgar, same; British str. (new) Ullapool, same; British str. Levenpool, same; British str. Madras City, Portland to Naples, Jan., Strauss & Co.; British str. Mabriton, Vancouver to U. K.-Continent, 30/6, Jan. Feb.; British str. Quebec City, Vancouver to Antwerp or Rotterdam, 31/-, Jan./Feb.; Earl Stoddard; British str. Paris City, Vancouver to Antwerp or Rotterdam, 30/6, Hamburg 31/-, Feb.-March, Canadian Cooperative Wheat Producers; a common steamer, Vancouver to U. K.-Continent, 32/-, Feb.; British str. Farnwroth, same, Feb., Heatley & Co.; Italian str. Artena, North Pacific to Antwerp or Rotterdam, 30/-, Feb.; a Ropner str., Portland to U. K.-Continent, 32/-, March; British str. Afghanistan, Vancouver to U. K.-Continent, Feb.; British str. Carlton, same; British str. Holystone, same; British str. Kafiristan, same.

The following steamers are reported fixed with lumber to the Orient: Japanese str. Misaki Maru, Columbia River to Yokohama and Kobe, Dec., Canadian American Shipping Co.; Japanese str. Havre Maru, Puget Sound to Japan, Jan., Yamacho & Co.; Japanese str. Heiyei Maru No. 7, same, W. L. Comyn & Co.; Japanese str. Yayoi Maru, North Pacific to Japan, Jan.; Yamacho & Co.; American str. Arizonan, same, Jan., Hammond Lumber Co.; Japanese str. Shunsei Maru, same, M. Nakata Co., Ltd.; Japanese str. Boston Maru, same; Japanese str. Rozan Maru, same, Jan., Nakagawa & Co.; Japanese str. Clyde Maru, same, Jan.; Japanese str. Kohryu Maru, same, two ports Japan, \$9.30, Jan., Yamashita Co.

The British m.s. Hurry On is reported fixed with lumber from Puget Sound to Maracaibo, Jan. loading, by W. L. Comyn & Co.

The American m.s. Frank Lynch

is reported fixed with lumber from the North Pacific to Cuba, Jan. loading, Hammond Lumber Co.

For lumber to South Africa, the British m.s. Larchbank is reported fixed, Vancouver loading, Jan. Feb.

The following tanker fixtures are reported: British str. Antietam, California to New York, gas oil, spot loading; British str. British Lantern, California to U. K.-Continent, 28/-, Feb.; British str. Highgate, San Francisco to Australia, prompt loading, case oil, J. J. Moore & Co.

The following time charters are reported: Swedish m.s. Strassa, delivery Colon, redelivery North of Hatteras, lumber, \$1.37¹/₂, Dec., H. R. MacMillan Export Co. and Nor-

wegian str. Dicto, delivery Cuba December, 3 months, redelivery North of Hatteras, via British Columbia, \$1.

The following sales are reported: American str. Willa Crosby, (vessel renamed Admiral Maser), Crosby Marine Corp. to Pacific S. S. Company; American str. El Abeto, El Cedro, and El Cicuta, L. A. Lumber Products Co. to James Griffiths & Sons; American str. Griffco, James Griffiths & Sons to Inter-Island Steam Navigation Co., Honolulu; American str. Johanna Smith, Coos Bay Lumber Co., to Pillsbury & Curtis; American str. Munami and Munleon, Munson S. S. Co. to McCormick S. S. Co.

PAGE BROTHERS, Brokers.

Mirrabooka Round The World

THE motorship Mirrabooka, a name meaning Southern Cross, in the tongue of the Australian native, sailed January 21 on her maiden voyage from Gothenburg for Los Angeles via the Panama Canal, according to advices reaching the General Steamship Corporation.

Mirrabooka is a combination passenger and freight vessel, recently completed in Swedish yards, and with her two diesel engines, developing 6500 indicated horsepower, she is capable of maintaining a sea speed of 15 knots.

Her passenger facilities accommodate thirty, and are elegantly furnished, including several cabins with bathrooms, a large dining room, a ladies' parlor, a smoking room and bar. Part of the promenade deck is entirely enclosed and a substantial space is reserved on the boat deck for the comfort of passengers.

Her first voyage will be round the world, and is sponsored by the Swedish Weekly "Veckojornalen." From Los Angeles, where she will take on general cargo, she will proceed to Brisbane, reaching this destination in seventeen days; thence to Sydney, Melbourne, Perth, Colombo, Aden, and Naples, returning to Gothenburg.

While this vessel has been built primarily for the wool trade between Australia and Europe, it is anticipated that she will be frequently seen on the Pacific Coast in the off season, when she will be

engaged in the service of the California-Australia direct line of the Transatlantic Steamship Company, whose vessels are managed on this coast by the General Steamship Corporation. Other ships engaged in this service are the motorships Bullaren, Eknaren, Tisnaren, Yngaren, and the steamers Anten, Boren, Roxen and Tolken. This fleet affords monthly sailings direct to the principal ports in Australia, carrying substantial cargoes and numerous passengers.

Port Notes

Stockton, California. The deep water canal project which will make the San Joaquin river deep enough to accommodate ocean freighters will be started this year. The City Council has started the acquisition of lands for the construction of a terminal and harbor basin, while the federal government, State of California, and City of Stockton will expend \$1,239,000 for dredging. It is estimated that the project will cost \$6,000,000 and will give direct deep water shipping facilities to this greatest agricultural producing district of California.

Port Orford, Oregon. Papers of incorporation were filed in December by the Port Orford Harbor and Development Company, with capital stock of \$2,000,000, and headquarters at Port Orford, by A. B. Dodd, C. R. Wade, and George W. Soranson.



Navigation of
U.S.S. California

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THE CALIFORNIA'S gyrocompass equipment is in full keeping with the modernest philosophy. The Sperry Gyro-Compass, with scripper at wheel, a bearing repeater on top of the wheelhouse, a course recorder and Gyro-Pilot are provided. Two Sperry 18" Searchlights, incandescent type, and a Rudder Indicator are also a part of the bridge equipment.

The Gyro-Pilot is of the TWO UNIT type, giving a full following and oversteering for land as well as automatic steering.

Units recently installed in various parts of the world provided with Sperry Gyro compass equipment: UNITED STATES: California, San Dieguito, Light House, Japan, Hawaii, Alaska, GULF OF MEXICO: Florida, Texas, ALABAMA: Alabama, ALABAMA: Alabama.

S P E R R Y
THE SPERRY GYROSCOPE COMPANY
BROOKLYN NEW YORK



Captains Courageous

(Continued from Page 51)

as possible, and hauled the ship back. A boat was put out with the third mate in charge, ordered to pull astern for the man. They then wore ship and steered back, the wind being just right to allow of this being done, although it was breezing up all the time and getting so thick that visibility was limited to only a few ships lengths. Wind and sea increasing, Captain Nichols feared that the man overboard and the boat's crew would all be lost. With main topsails aback and those on fore and mizzen drawing, the ship was slowly retracing her former course, all hands being on the lookout. About half an hour after the ship was turned back the man overboard was discovered right ahead and was soon taken on board without the assistance of a boat. It was now coming on towards dark, with boat and her crew nowhere in sight. Backed and filled on ship for another hour or more, when the weather having cleared a little the boat was seen to leeward and was soon hoisted on board, when the ship was put on her course again. Before eight o'clock the wind had shifted to the westward, blowing a whole gale with a heavy sea, ship under topgallants and taking on much water fore and aft. The man rescued had been in the water an hour and twenty minutes, in a suit of oil clothes and rubber boots. When asked by Captain Nichols why he had not discarded some of his clothing he said he had no time to do so, being obliged to fight off the albatross that was pecking at him all the time.

Among other commands of Captain Albert W. Blanchard was the bark Herbert Black and the ships Puritan and Bangalore. The two latter were built of iron and originally under the British flag, the Puritan being a four-master. On one voyage of the Herbert Black to the West Coast of Central America, the rudder was carried away in the South Atlantic. Captain Blanchard succeeded in building a jury rudder, rounded the Cape and reached his destination. After calling at a number of different ports on the Coast, he returned around Cape Horn to New York under the jury rudder, a feat that is believed never to have been equalled. The scars made by the chains controlling the improvised rudder were visible in the planking under the vessel's runs for many years. After giving up sea life, Captain Blanchard engaged in the stevedoring business at New York. He has recently disposed of these interests to retire to his old home in Searsport.

Aside from other vessels, the master builders of Searsport contributed fifteen full rigged ships to the American mercantile marine, the first of which was the B. Aymar, 516 tons, launched in 1840 by John Carver. This ship was 128 feet long, by 28, by 19 feet. She was commanded by Benjamin Carver, 1st. John Carver also built the John Bunyan, 647 tons, in 1850, and the Charter Oak, 964 tons, in 1854. They were commanded by Amos Nichols, Sr., and Phineas Pendleton, 2nd, respectively. In 1854, the Martin Luther was built by James Burgin and the Mary Goodell by Eben Mayo. They were commanded by Amos Nichols Sr. and Daniel S. Goodell, respectively. Between 1857 and 1877, master builder M. Packard launched the Matilda, S. F. Hersey, Oneida, John C. Potter, William McGilvery, Premier, and William H. Conner. Elisha Dunbar built the R. R. Thomas in 1876, and George A. Carver built the B.

F. Carver in 1862 and the Clarissa B. Carver in 1876. The William H. Conner, 1496 tons, was the largest, as also the last full rigged ship built in Searsport.

Many ships were built at other ports largely with Searsport money. Some of those from Belfast, Maine, were the Louis Walsh, Frank Pendleton, Nancy Pendleton, and Leonora. From Bangor or Brewer, Maine, came the David Brown, Harriet McGilvery, Luch A. Nickels, and the bark C. A. Littlefield. From Bath, the Abner Coburn, Governor Robie, and Josephine. From Newburyport, Massachusetts, came the Susan Gilmore, Brown Brothers, Escort, and the barks Harvester, Wakefield, and Edward Kidder.

Shipping Conference at Washington

(Continued from Page 53)

President Opposed to Government Ownership

While this conference was in progress a statement emanated from the White House expressing the opposition of President Coolidge to permanent government ownership of the merchant marine. While Coolidge is thoroughly acquainted with the terms of Senator Jones' bill providing continued government operation he said he is not favorable to most of the terms. The chief point which drew out the presidential opposition is the requirement that a unanimous vote of Shipping Board members be necessary before sales of government vessels can be made. Such a provision is unwise, he says, because it permits one member of the board to control the body by his single negative vote.

President Coolidge believes that the country can be best served and the interests of the merchant marine best promoted by private capital, and he believes that the upbuilding of the merchant fleet under the American flag probably can be accomplished by means of mail contracts and arrangements affecting officers and men, and in this way aid can be given to private steamship owners.

As we go to press, word comes that the Jones Bill has passed the Senate. This bill is aimed at continued government ownership. It will now go to the House, where it may be defeated. If not, it is certain to be vetoed by President Coolidge.

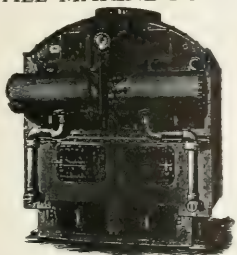
Wainright Bill

Representative Wainright of New York has introduced a bill in the House which authorizes and directs the Shipping Board to offer for sale the United States Lines in accordance with the provisions of law with the understanding that the purchaser or purchasers will construct two new high-class passenger and cargo ships to augment the service. The Shipping Board is directed, under the Wainright bill, to loan to the purchaser \$30,000,000 for the construction of new tonnage. If the Board is unable to sell the United States Lines, Representative Wainright provides in his bill that the government construct two vessels at a cost of fifteen million dollars each within six months from the date of approval of his act.

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FOR ALL MARINE PURPOSES



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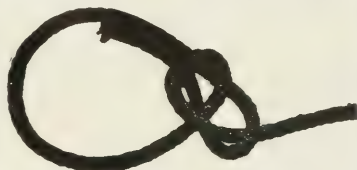
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DURABLE WIRE ROPE COMPANY

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Durable Wire Rope



The MARLINE SERVED ROPE

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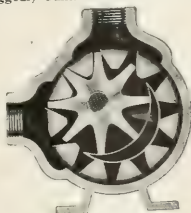
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SEATTLE, SAN FRANCISCO, PORTLAND
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Viking is a simple, quiet running durable pump of the rotary type. Has only two moving parts. Accurately machined, ruggedly built.



Capacities: 1 to 1000 gals. a min.
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Our success is due to the high quality of alloy steel used, together with the careful workmanship that enters into each tool.

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Pacific Marine Review

The National Magazine

of Shipping

March, 1928

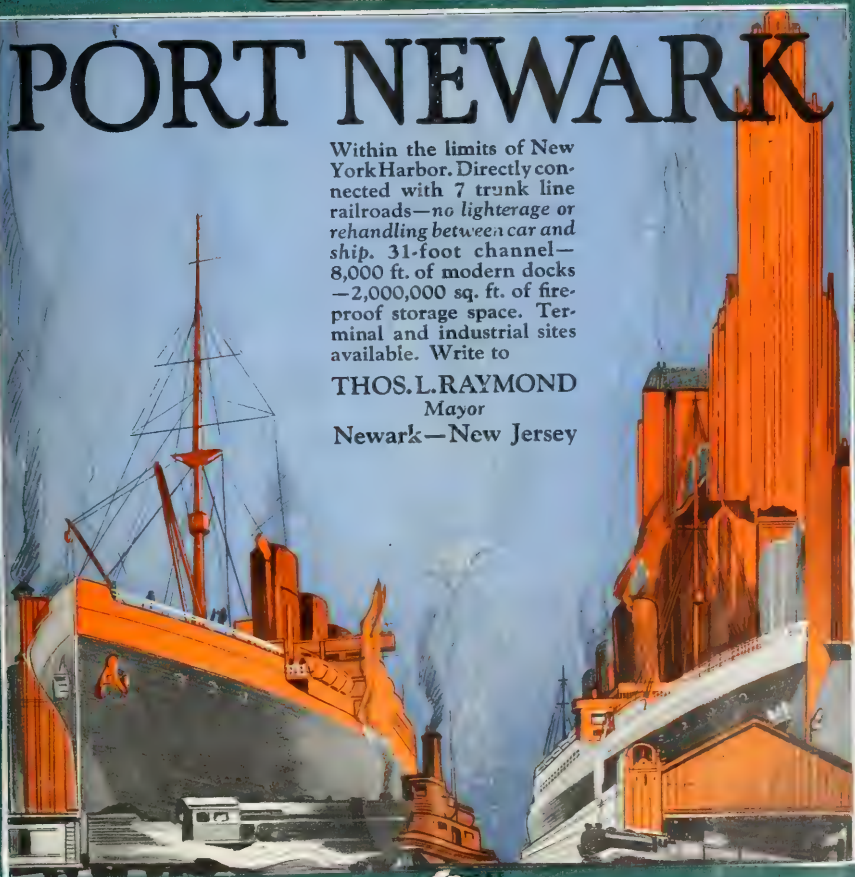
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(From Painting by Charles R. Patterson, America's foremost Marine Artist)

AMERICAN SHIP HENRY B. HYDE

Shortening Sail in a Heavy Breeze



The Henry B. Hyde

THE HENRY B. HYDE, as fine a specimen of marine architecture as ever floated, was launched from the Flint yards at Bath, Maine, in November, 1884, John McDonald master builder. Many shares in her were owned by Searsport men and during the early years of her career she was managed by Pendleton, Carver & Nichols, formerly of Searsport but then engaged in business at New York as ship owners and brokers.

On her first voyage the Henry B. Hyde established the reputation of being a fast sailer and this was consistently maintained until her loss on the Virginia coast in 1904. On April 26, 1888, she left San Francisco for New York under command of Captain John G. Pendleton of Searsport with a full cargo of sugar. Amos D. Carver, now of Baker, Carver & Morrell, wholesale marine supplies, New York, whose father was a member of the firm managing the Henry B. Hyde, remembers well the arrival of the ship at New York and recounts the incident as follows:

"When the ship was reported to my father by towboat men as being off the Hook it was on July 23, the days she was out were checked up and found to be 87. My father said that it must be a mistake. Later when Captain Pendleton came walking into the office and extended his hand to my father, with the inquiry, 'Well George, how are you?' Any letters from home for me?' the reply was, 'No John; we were not looking for your arrival for three weeks. I'll say, John, you sure made a fine run.' 'Fair, George; only fair. I'd have broken the record if we hadn't been becalmed on the equator for ten days.'"

Another big
WASHINGTON--ESTEP
DIESEL



for the
KITSAP COUNTY
TRANSPORTATION CO.

The El Paso County Transportation Council has awarded the design for a third WASHINGTON COUNTY bridge.

It was 100 HP and will be used to power the propellers that were building at the JAW. Washington, Singapore.

They are now operating a 100 HP WASHINGTON FERRY Dredge on the Ferry "KISSAM" and a 100 HP WASHINGTON FERRY Dredge on the Ferry "HIVY."

It's the second or third order that tells the story

WASHINGTON IRON WORKS
SEATTLE, U.S.A.

At the same time, the K^{+} and H^{+} ions are

1. The first step is to identify the problem.
 2. The second step is to define the problem.
 3. The third step is to analyze the problem.
 4. The fourth step is to develop a solution.
 5. The fifth step is to implement the solution.
 6. The sixth step is to evaluate the solution.

[illegible]

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship
Association

James S. Hines,
President and Publisher.

Bernard N. De Roche,
Vice-Pres. and Manager.

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor.

Paul Faulkner,
Advertising Manager.

Shipping Board Off the Pacific

DURING the past month three sales of ships and services on the Pacific Coast have virtually cleaned up the operating end of the United States Shipping Board, so far as the Pacific Ocean is concerned. These ships and services have all gone into the hands of competent private shipowners and will no doubt be efficiently and successfully operated. This is particularly true of the twenty-one vessels which had been running in the Oriental and Australasian services out of San Francisco and which were purchased jointly by the American Hawaiian Steamship Company and the Matson Navigation Company.

The consummation of these sales is another very important step towards getting the federal government out of the ship operating business. This step was taken against much opposition in the Middle West and at Washington. In fact, at the time it was being considered, the Senate, by a large majority, passed the Jones Bill with the very evident intent of stopping all such sales. The Jones Bill will probably be defeated in the House, and even if passed will meet a Coolidge veto. In the meantime, three or four House resolutions are up for action. Two of these, the Wood and the White resolutions, are very constructive and offer much needed assistance both to shipowners and to shipbuilders where vessels are engaged in the foreign trade.

The Senate debate over the Jones Bill developed some rather curious twists of the Senatorial mind; as for example: That vessels composing the Shipping Board fleet were all obsolete; absolutely hopeless in competing with modern fast European freighters; needing immediate replacement. That no sales of such obsolete junk must be made unless buyer guarantees to keep it operating on a nonpaying service under the American flag for ten years. Above all that, no sales be made to any combination which would be powerful enough to operate this junk for five years and then sell this junk at a high profit to some of our European or Asiatic competitors. And so on ad nauseam.

The romance and glamour of the sea and the sweet dream of our white-winged eminence in other mercantile marine days still make great bases for spell-binding orations that consume much valuable time but make good copy for the home papers.

Reduced to simple form, the problem of Congress is, How can we provide the American ship operator in the foreign trade with government aid of from 7 to 10 per cent on his investment without calling it a subsidy? In most routes a subsidy amounting to 7 per cent of

the present cost of investment in ships built in American yards would enable the American operator to compete in foreign trade and just about break even, making occasional good profits by seizing good opportunities. At the present time those Americans who are competing on foreign trade routes are enabled to do so only because of the favorable capitalization possible through purchase of Shipping Board vessels at low cost. When replacement is necessary there will be another story, unless by that time Congress shall have learned how to solve its problem.

The problem of operating differential will still be with us when the government is out of the ship operating business, but private initiative and private capital will then be more free to work out the problem. In ordinary times commercial shipping never pays big dividends. It exists with a watchful eye to windward, waiting for a break that will enable it to make big profits for a little while. Under normal conditions, these opportunities do not last very long because they stimulate shipbuilding. But under such abnormal conditions as we now have, with the richest nation in the world maintaining a large fleet of idle tonnage ready to throw it into competition under the political slogan "Save the Farmer," how can a poor private owner ever get a favorable break?

The present tanker situation illustrates very nicely how shipbuilding automatically reacts to bring down profitable rates, and the way in which the Shipping Board jumped into the grain tramp trade during the British coal strike illustrates how United States Government competition operates to prevent profits to private shipowners which would be perfectly legitimate under the normal supply and demand condition. In this latter instance the Board probably spent \$15,000,000 of the people's money to save American wheat brokers from paying a couple of hundred thousand dollars extra freight to some American or foreign shipowners.

The stringent regulatory and restrictive legislation in our Marine Code, added to such direct competition by the government, is very discouraging to any capital which may be seeking investment in American foreign trade shipping. We are glad, therefore, that such competition is practically over on the Pacific; and that fact gives us hope that the other oceans may soon be likewise free and that we may then look forward to some more constructive and helpful measures for putting our Merchant Marine Policy on a permanent basis.

Greater Prosperity Through Greater Foreign Trade

ONE more step to all Americans interested in international commerce. One more step to the realization of the dream of a world of peace and prosperity. It is the 1923-24 Convention for the Facilitation of International Commerce, to be held in Havana, Cuba, April 29 to May 10, 1924. This convention is to be held in Havana, Cuba, April 29 to May 10, 1924. This convention is to be held in Havana, Cuba, April 29 to May 10, 1924.

The study of the many phases of international commerce is the first step in the study of the many phases of international commerce. It is the first step in the study of the many phases of international commerce. It is the first step in the study of the many phases of international commerce.

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All those who are interested in the development of foreign trade and commerce in national commerce, whether in agriculture, commerce, industry, finance or transportation, all members of community, boards of trade, national and state associations, and other industrial and commercial organizations as well as firms and individuals engaged in foreign trade, are cordially invited to participate.

Your cooperation toward making this Convention a success and toward giving it the representation of every section of the country and every factor of international commerce, and thus making its service nationwide, is earnestly invited.

Italian Merchant Marine Subsidy Policy

During the present year the Italian Government will put into full operation its new marine policy. This policy was first formulated when the Fascist Government came into power in 1922, being put into partial operation the following year. Because of changing economic conditions in Italy the policy was modified from time to time and in 1926 it was modified to meet the actual needs.

The keynote of the new shipping system is the complete separation of the government from ownership and operation of the merchant marine, including the merchant steamers which for many years were operated by the Government in connection with the State-owned railroads.

At the present time, the Italian merchant fleet con-

sists of 1,000,000 gross tons, of which 400,000 tons are Italian. The Italian fleet was placed on a new basis of ownership and control in 1926. The Italian fleet was placed on a new basis of ownership and control in 1926. The Italian fleet was placed on a new basis of ownership and control in 1926.

The separation of the government from the "merchant" fleet has been a long and painful process. It is the first step in the study of the many phases of international commerce. It is the first step in the study of the many phases of international commerce. It is the first step in the study of the many phases of international commerce.

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The purpose underlying the present Italian marine policy is the promotion of the national welfare by establishing and developing communications by sea between the Italian mainland, the islands in the Mediterranean Sea and the Italian settlements on the coasts of Africa. This purpose has, since the traditional connection of Italy with the sea, been of importance with the rapid increase in the Italian population. While the "indispensable" lines will be used to bind more closely the Italian colonies with the mother country, the "useful" lines will serve to aid in the promotion of Italian foreign trade.

(Department of Commerce Bulletin.)

Does Research Pay?

ABOUT five years ago in New England a live and restive group of businessmen organized among themselves a research association. Eleven companies comprised the group, which included a machine tool builder, a publishing house, a chain cotton mill owner, a tanner, a textile machinery house, a rubber goods manufacturer, and several others. The annual value of their combined products totals more than one hundred and fifty millions of dollars. They pool business information and exchange intimate facts about their methods and costs. They are candid about their errors and shortcomings. Their staff members compare notes with one another, they make rounds of inspection of one another's places of work. Profitable ideas come from facts in the possession of the team members which are assembled for the common good. An irrefutable illustration of the value of this research plan is found in the experiences of two members who, after a report of one subcommittee on internal transportation prob-

lems, effected a saving of \$35,000 a year in each case.

There can hardly be found a stronger argument for organized fact-finding, cooperating for new knowledge and mutual help in its application.

It has been the mistaken conviction of many smaller manufacturers that research is a luxury and an overhead that undoubtedly did some good for large corporations that could stand the expense. The dramatic research work and accomplishments of large concerns have somewhat tended to obscure the fact that science and the methods of science are the most democratic of all human instrumentalities, asking only to be used. A tremendous amount of data on an almost inconceivable variety of subjects is available and it only remains for the individual, whether a small or large concern, to assimilate it and apply it to specific problems.

The value of research in the conduct of business is emphasized when one considers that today three types of business strategy are receiving the greatest attention. They are:

The strategy of location.

The strategy of unique product, such as that based upon a patent.

The strategy of utility and quality.

It is the last of these that is arousing the interest of practically all intelligent business men in the face of present day competition. To successfully meet the challenge of business strategy calls, obviously, for good management, which may be summarized by the following characteristics:

Foresight; that is, seeing the problem ahead.

Planning; that is, charting an appropriate course of action.

Control; the direction of the planned course to the desired end.

The achievement of these three characteristics of good management and to make them spell business success calls for definite knowledge based upon facts. Business men must substitute foresight for hunch, information for opinion, knowledge for gossip, and hard, cold facts for tradition.

There is perhaps no business in America more needful of the beneficial results to be derived from research than is the shipping business and its silent partner, terminal operation.

One of the Old Indiamen

By Frank C. Bowen

SOME of the ships of the old East India Company had remarkably interesting histories, although the clipper ship men looked down on them as "tea wagons" and derided their regular custom of snugging down to topsails every night, a custom which made for very long passages but which was apparently quite agreeable to the John Company and which was certainly eminently agreeable to the captains, who had a chance of making a good income out of the victualling.

For many years the company was very jealous of its privileges and, as many of the court of directors were interested in the British shipbuilding industry, they strove lustily to prevent any Indian-built ship being admitted to British registry or employed in the company's regular services, although they were ready enough to pick them up for a voyage when the ordinary British-built tonnage was short. They succeeded in their efforts for many years, but during the Napoleonic Wars the French privateers and frigates made such inroads into the British commercial fleet that in spite of their opposition measures were passed which permitted Indian-built ships to be given British registry after each case had been discussed on its merits and every possible objection raised.

Later still a more broadminded policy was adopted, and ships built within the British Empire were given the right to British registry as a matter of course. It was then that the ship's husbands discovered that the vessels built in Bombay of the finest Indian teak were cheaper and generally more satisfactory than the British-built ships and there was soon a rush to order tonnage in the shipyards that were maintained by the Parsees in the Presidency. The Indian ship Charles Grant was one of the ships so built, being launched in 1810 in Bombay on the bottom of the Ganges.

This phrase requires a certain amount of explanation. Quite early in his career the John Company discovered that running its own ships was a very expen-

sive business, and effected a great saving by chartering them from outside owners, or Ship's Husbands as they were then called. It was only in exceptional circumstances that they would charter any odd ships, however, and practically all of the East Indiamen were built to their specification and frequently under the superintendence of their surveyors. Before a ship was laid down they would agree to charter her for so many voyages, generally six only, at the end of which time it was reckoned that she would be worn out for the East India Company's service and she was demobilized, although she frequently had many years' more work left in her.

In spite of the regulations the majority of these ship's husbands were intimately connected with the management of the East India Company, and they gradually managed to hedge their position round with numerous privileges. Thus the hereditary bottoms came into existence, the husbands claiming the right to supply another ship the moment theirs was out of service through age or any other reason. Thus the Charles Grant came to be built on the bottom of the Ganges, under the ownership of William Moffat, who secured a six-voyage agreement for her.

She was a magnificent ship of 1274 tons builder's measurement, which the company at this time admitted as the standard for charter rate, and like all Bombay ships, she was built to last. Thirty-six guns were originally mounted on board on two decks, and her regular crew at the start of a voyage consisted of 130 men. Even at this date, when steps were being taken to combat scurvy, the number of men at the end of the voyage was generally very different, and many of the places of British seamen were taken by natives.

She was put under the command of Captain T. T. Harington for the passage from Bombay to the Thames, sailing in February 1810 and apparently mak-

(Continued on Page 114)

Port Administration in Great Britain

By Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign and Domestic Commerce

EVERYWHERE throughout the world, port administration is becoming more and more important. In the United States, the Federal Government is now taking an active part in port administration, and many of the great ports of the world are being developed by the Federal Government. In the United Kingdom, the port administration is a matter of great importance, and the Federal Government is now taking an active part in port administration.

Types of American Port Administration

In the United States, the port administration is of three types: (1) Public Ports, (2) Semi-Public Ports, and (3) Private Ports. Each of these types has its own characteristics and its own advantages.

(1) **Public Ports**, which are owned and administered directly by the Federal Government. These ports represent the best and most successful of all forms of port administration.

(2) **Semi-Public Ports**, which are the property of a State or Federal Government, but are operated by a municipal corporation, and at which a varying degree of Federal control is exercised. As a result of this kind of port administration, the Federal Government has been able to secure the best of both worlds, and to secure the best of both worlds.

(3) **Public Trust Ports**, which are owned and administered through public trusts composed of non-salaried members of the community, and of the community. These are separate corporations, independent of all control from the municipal government of the port cities, and are controlled by the community of the port cities. Examples of this type are Seattle and Grays Harbor, Washington, also Jacksonville and Tampa, Florida.

(4) **Private Ports**, which are owned and administered by private corporations, and are operated by the community. These ports are of two types: (a) ports which are operated by the community, and (b) ports which are operated by the community. These ports are of two types: (a) ports which are operated by the community, and (b) ports which are operated by the community.

It is quite evident from this diverse type of port administration in the United States, that the Federal Government has been able to secure the best of both worlds, and to secure the best of both worlds. Therefore, it is quite evident from this diverse type of port administration in the United States, that the Federal Government has been able to secure the best of both worlds, and to secure the best of both worlds.

Port of London Operation

One of the most striking features of the port administration in Great Britain is excellently illustrated in the operation of the Port of London in which the rate payers, that is, the community, and the community, have a large voice. It is noteworthy that the members of the Port of London Authority. This is a most unique and democratic step in port administration and is in sharp contrast to the American method which is largely one of political control.

In the Port of London Authority, as constituted by the Act of Parliament of 1908, the governing body is

composed of representatives of the community and of the community. This is a most unique and democratic step in port administration and is in sharp contrast to the American method which is largely one of political control. The members of the Port of London Authority are elected by the community, and the community, have a large voice. It is noteworthy that the members of the Port of London Authority are elected by the community, and the community, have a large voice.

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Port of London Act, 1908

Part IV.

Provisions as to Election of Elected Members

(1) The members of the Port of London Authority shall be elected by the community, and the community, have a large voice. It is noteworthy that the members of the Port of London Authority are elected by the community, and the community, have a large voice. The members of the Port of London Authority are elected by the community, and the community, have a large voice.

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(a) In the case of a person entered on the register as a payer of dues:

Where the dues amount to £	10 but does not amount to £	25 votes
25	50	2
50	100	3
100	200	4
200	400	5
400	800	6
800	1,500	7
1,500	3,000	8
3,000	5,000	9

and for every additional £2,000 over £5,000 one vote, so, however, that the total number of votes to which any one payer of dues is entitled shall not exceed fifty.

(b) In the case of a person entered on the register as a wharfinger:

Where the rateable value of the premises amounts to £	125 votes
50 but does not amount to £	250
125	500
250	1,000
500	1,500
1,000	2,000
1,500	3,000
2,000	4,000
3,000	5,000
4,000	

Where the rateable value amounts to £5,000 or over, 10 votes

(c) In the case of a person entered on the register as an owner of river craft:

Where the number of craft owned amounts to 10 but does not amount to 10	Votes
10	30
30	50
50	100
100	150
150	200
200	300
300	400
400	500

Where the number of craft owned amounts to 500 or over—votes, 10.

(9) Subject to the provisions of this schedule the persons entitled to vote at an election of a member to be elected by wharfmasters shall be the persons entered upon the register as wharfmasters and no others, and at such an election each person shall be entitled to give one or more votes according to the scale hereinbefore contained.

(10) Where a wharfinger is the occupier of two or more premises separately assessed, he shall be entitled to be entered on the register and to vote in respect of each of such premises in like manner as if as respects each of such premises he were a separate person.

(11) Where any dues have been paid on account of a company or a firm, or the owners of any ship or river craft who are not partners, or where a company or a firm or an association or body of persons are the occupiers of such a wharf, quay, warehouse, or granary as aforesaid, or where any river craft is owned by a company or a firm or by persons who are not partners, the dues shall be deemed to have been paid on his own account by such one of the directors or officers of the company or partners in the firm or members of the association or body or owners of the ship or river craft or other person as the directors or firm or association or body or owners may appoint in the prescribed manner, and the wharf, quay, warehouse, or granary shall be deemed to be occupied, and the craft owned, by a director or partner or owner or member similarly appointed.

(12) Where a person possesses more than one qualification he shall be entitled to be entered on the register and to vote in respect of each such qualification, in like manner as if as respects each such qualification he were a separate person.

(13) If at any time it appears to the Board of Trade that, as a result of the qualifications and scales of votes fixed by this Schedule the voting power of any voters or class of voters is disproportionate or inadequate having regard to their interest in the Port of London, the Board may by provisional order make such variations in those qualifications or scales of votes as may seem to them to be just, and may provide for different qualifications and different scales of votes for different classes of payers of dues.

(14) All proper expenses of or incidental to the formation or revision of the register, or of or incidental to an election of an elected member shall, subject to any regulations in any order of the Board of Trade made under this Part of this Schedule, be defrayed by the Port Authority.

(15) The Port Authority shall not themselves be entitled to be

entered or to appoint any person to be entered, on the register in respect of any qualifications possessed by the Port Authority.

(16) Any forms provided or sanctioned by the Port Authority for use in connection with the payment of any dues shall contain a column for the insertion therein of the name and address of the person on whose account the dues are paid:

Where dues paid by any person are paid by him on behalf of any other person and are directly recoverable by him from that other person that other person shall if he so requires be entered as the person by whom and on whose account the dues are paid:

Provided that where the owner or master of a ship or a public wharfinger has in pursuance of the Act paid rates on goods on behalf of some other person the rates shall for the purpose of this Schedule be deemed to have been paid by and on account of such other person.

Subject as aforesaid the person by whom the dues are paid shall for the purposes of this Schedule be deemed to be the person on whose account they are paid.

(17) For the purposes of this Schedule "dues" shall not include fees in respect of the registration or licensing of craft and boats but shall include payments in commutation of dues.

(18) For the purposes of the first election under this Act "dues" shall include dues of such classes and in respect of such services only as may be set forth in a Provisional Order to be made by the Board of Trade.

Ports and Harbors of the United Kingdom

The seaports and harbors of the United Kingdom are subject to the jurisdiction of the state mainly in two respects:

(1) Through the local harbor authorities acting under powers conferred by Parliament, and

(2) Through the Customs and Excise department acting in conjunction with the Treasury.

Local Harbor Authorities

There are in the United Kingdom over 400 harbor authorities having statutory powers. The most important of these authorities have been specially constituted by Act of Parliament; e.g.,

The Port of London Authority, 1908;

The Mersey Docks and Harbor Board, 1857-1920;

The Belfast Harbor Commissioners, 1847-1918;

The Tyne Improvement Commission, 1850.

The greater number, however, have been constituted by Orders issued by the Board of Trade under the General Pier and Harbour Acts of 1861 and 1862. (The powers conferred by these Acts are now exercised by the Ministry of Transport.)

A few harbors are governed directly by the State; for instance, Holyhead and Ramsgate by the Ministry of Transport, and Portsmouth and Rosyth by the Admiralty. In general, however, the large ocean ports are of the type of American public-trust ports, as, for instance, Liverpool, London and Glasgow. Bristol is of the municipal type and Southampton and Cardiff are private ports.

A port and harbor authority usually owns and controls the docks and quays and also acts as the conservancy authority. In some cases, e.g., the Humber ports, the docks are controlled by railway or other companies, whilst the harbor is controlled by a Conservancy Board.

The Port of London Authority as constituted by the Act of 1908 will illustrate the constitution and functions of the principal port authorities.

The governing body is composed partly of appointed and partly of elected members, as has already been described in considerable detail.

Under the Port of London Act, the following responsibilities and powers were transferred to the Authority:

(a) The undertakings of the various dock companies about the Thames.

(b) The powers of the Thames Conservators in respect of the lower river from Teddington Lock to the sea.

(Continued on Page 41, Ads. Sect.)

By H. G. Smith, Vice President,
Bethlehem Shipbuilding Corporation, Ltd.

The following is a list of the names of the persons who have been elected to the office of Justice of the Peace for the year 1900:

*** Thanks to the following for their help:

in a continuous decline. Left-over war contracts for both the Navy and Emergency Fleet Corporation and a fair amount of new business in 1919 and 1920 maintained fair activity in the shipyards until the end of 1921, although the amount of new business taken on in 1921 was very small. From 1922 to 1927 inclusive the total American merchant shipbuilding per year, as taken from Lloyds reports, is, with one possible exception, less per year than for any pre-war year since 1897, and in comparison with the building in foreign countries from 1922 to 1927 the United States presents a sorrowful picture.

Grand total world tonnage	7,900,847
Tonnage built in United States	309,264
Grand total number of vessels	1,034
Total built in United States	41

Another analysis made of foreign built vessels of 1900 tons gross tonnage registered in the United States trade of the United States under the Merchant Marine Act of 1920 shows 65 vessels of 370,417 gross tons. This tonnage exceeds the gross tonnage of vessels of 4500

For many years prior to the war, the larger American shipyards had a large staff of highly trained technical employees. It was from the staffs of these yards and from other shipyards engaged only in commercial work that engineers, architects, designers, and supervisors were drawn to form the nucleus of the many new shipyards that sprang up during the World War and participated in building vessels. Of the older shipyards in 1916 there were sixteen engaged in the building of large steel vessels.

For every man employed in shipbuilding in the United States in 1916 about eight times as many were engaged in the art at the end of 1918; so that for each man in service in 1916 seven others were trained for

Conference Board, Inc.

tons and above built in the United States during the period from January 1, 1922, to August 15, 1927.

Again referring to the tonnage built in the United States and principal shipbuilding countries of the world, from January 1, 1922, to August 15, 1927, an analysis shows that Great Britain has built fourteen times as many vessels as the United States; Germany three times as many; Italy almost twice as many; and Holland and France each thirty per cent more. At the present time the United States stands a poor eighth in the quantity of its total merchant shipbuilding under contract. Great Britain, Germany, Italy, Holland, France, Sweden, and Denmark, each in the order named, has more tonnage under contract of construction than the United States. The total tonnage under construction in the United States as reported by Lloyds at the end of 1927 is 97,370 gross tons.

Of the sixteen steel shipyards existing in 1916 only eight and one new yard started in 1917 are now in operation. Three of these yards are now engaged almost wholly in repair work. In each of the five largest shipyards now building steel vessels the average number of vessels contracted for per year for the last seven years has been less than $2\frac{1}{2}$ vessels.

Included in these figures are five naval contracts placed in 1927. Excluding these contracts the remaining contracts average not more than \$1,000,000 each, an amount of work sufficient to keep employed a staff of not more than 1250 men for each yard or one third of the men necessary to operate these yards efficiently. Among the shipyards that have closed are those of William Cramp & Sons Ship & Engine Building Co., and the Harlan Plant and the Sparrows Point Plant of the Bethlehem Shipbuilding Corporation. The first two are the oldest shipyards in the United States, and all are famous for building vessels of the highest grade. The closing of eight shipyards and the small volume of work in the remaining yards has reduced the available men on the shipbuilding technical staff of the United States to about one quarter of the number employed in 1916, and that means that the shipbuilding business is four times as bad as it was in 1916.

Causes of the Decline

The present condition of the shipbuilding industry in the United States is due to the following:

(1) The Reduction of Armament Conference in 1922 almost wholly suspended naval work in the United States and left the private shipyards to depend upon commercial work for their existence;

(2) The continued existence of the idle Shipping Board Fleet, which consists of about 500 vessels, most of which are not suitable to form a part of the American merchant marine. Because of their unsuitability and their age these vessels can be purchased at prices ranging from \$5 to \$10 per ton. They are purchased by small operators who operate them in competition with established ship lines and who are not likely to build new vessels to replace these low cost vessels when they have completed their few remaining years of usefulness. In the meantime, however, confronted with the competition of these low price vessels, the established operators cannot afford to incur the capital charges necessary for the building of new vessels.

(3) Admission to the Coastwise Trade, under Section 22 of the Merchant Marine Act of 1920 of sixty-five vessels of about 370,000 gross tons resulting in stagnation of new construction for the coastwise trade.

In a merchant ship costing the builder \$1,000,000,

about forty per cent is expended for labor and sixty per cent for materials. These materials are purchased in the United States and consist of steel, castings, copper, brass, lumber, machinery, equipment, supplies, and a multitude of other materials, each supplied by contractors other than the shipbuilder and require both labor and material in their production; so that the ultimate cost of a ship is wholly labor except the cost of the raw materials from the mines, forests, or fields. Eighty per cent of the total cost of a vessel is a fair valuation of the labor involved in its construction, of which one-half is spent in the shipyard and the other half is spent throughout nearly every known industry in our country from coast to coast.

Eighty per cent of a \$1,000,000 cost equals \$800,000 labor cost. At an average earning rate of \$3 per day, which is none too high, 160,000 labor days or approximately the employment of five hundred men for one year is involved in the construction of a vessel costing \$1,000,000.

Each ship as completed and put into operation requires additional American labor and wages during its entire service, first wages to the officers and men and, second, to workmen employed to provide supplies and equipment in the upkeep of the vessel while in operation.

The shipyards are dependent upon shipowners for their business. Shipowners, on the other hand, are dependent upon modern and well organized shipyards to build their ships. It is to the interest of the owner that the ship yards should be busy, because of their dependence upon volume of business for the maintenance of efficient technical and mechanical shipyard staffs, upon which the normal cost of shipbuilding is contingent.

The shipyards are an important national asset. Without them it would have been impossible to have built and kept in operation the vast fleet of ships for both the Navy and the Emergency Fleet Corporation required during the World War. The older shipyards were taxed to their capacity in building new vessels for the Navy and Fleet Corporation, and in addition many new yards sprang up like mushrooms and participated in ship construction. The private ship repair yards also performed an essential national service by reconditioning and repairing vessels for the Emergency Fleet Corporation and performing work in the value of \$73,000,000 for the Navy.

Sources of Shipyard Business

Private yards depend for new construction upon:

- (a) The Navy and Coast Guard,
- (b) The Shipping Board, and
- (c) The private shipowner.

Five navy contracts totalling about \$50,000,000 have recently been placed with private shipyards, but they are the only contracts of this character that have been placed during the past seven years.

The Shipping Board has not made a contract for new ship construction during the past seven years; it has, however, contracted for the reconditioning of a few of its vessels and even on several of these the work has been performed by the navy yards at an expenditure of several million dollars.

As previously stated, including contracts for the construction of passenger, combination, and cargo vessels, tankers, yachts, and sea-going dredges, contracts for the construction of only eighty-six merchant vessels have been placed with five shipyards during the

Some ships will be built for the navy. There is no prospect, however, that there will be enough of these ships built in private shipyards to provide from this source the substantial back-log which existed before the World War. The shipyards can be materially helped, however, by the navy yards discontinuing their competition and by building all naval vessels in private yards. To accomplish this substantial aid, the

restrictive provisions previously referred to should be eliminated from the acts appropriating money for naval construction and thereby give the Navy Department greater freedom and more discretion in awarding contracts.

The United States Shipping Board may undertake some new ship construction; this, however, is entirely problematical and cannot be depended upon as a continued source of demand for the facilities of the shipyards. There will be some construction for the domestic trade, but this will not be sufficient to save the shipyards. Private shipowners are not justified in contracting for the construction of new merchant vessels for the foreign trade in private shipyards of this country because of their higher cost than vessels constructed in foreign shipyards. The domestic pri-

vate shipyards therefore cannot anticipate orders for merchant vessels from private owners for this trade unless Congress provides such owners with aid to overcome this handicap of cost of construction.

The real answer to the problem is to establish a merchant marine policy that will encourage more shipbuilding for the coastal and intercoastal trade and make possible the building of vessels for the foreign trade. Bills now before Congress seek to accomplish this result and Congress should act favorably on them.

Education of our representatives in Congress on this vital subject is needed, and such education should emanate from the constituencies that elect them. Correct statements of facts well prepared and thoroughly disseminated are needed for the education of the American people.

Crews of Sailing Ships

Some Odds and Ends Concerning the Number of Men Carried on American Clippers

By An Ancient Mariner

BATES' "American Marine" has no tables referring to sailing ships, only crews of steamers being referred to. However, on Page 355, this statement appears:

"Thirty-five years ago (say 1859-1860), when American shipping was thought to have a chance to keep the sea carrying two to three men to the 100 tons, British ships of equal size carried three to four men to the 100 tons and other nations four to five men. Now (1895) British sailing ships averaging 1188 tons each carry only two men to the 100 tons." (There were fewer petty officers.)

The following figures are from a report of the Geneva Conference in settlement of claims for destruction of American shipping by Confederate raiders Alabama, Florida, Shenandoah, and others, 1861-1864:

Ship Anglo Saxon, 868 tons, old measurement (would be about 750 later measurement), crew of 32 men, being all hands from captain down (clipper ship).

Ship Avon, 946 tons, old measurement, 35 men.

Ship B. F. Hoxie, 1387 tons, old measurement, 49 men, half clipper.

Ship Southern Cross, 938 tons, old measurement, 34 men, half clipper.

Ship Commonwealth, 1275 tons, old measurement, 46 men, cargo ship.

Ship Crown Point, 1099 tons, old measurement, 40 men, cargo ship.

Ship Jacob Bell, 1381 tons, old measurement, 49 men, clipper, double topsails.

Ship Red Gauntlet, 1038 tons, old measurement, 38 men, clipper.

Bark Mondamin, 390 tons, old measurement, 16 men, cargo ship.

Bark Corris Ann, 568 tons, old measurement, 20 men, cargo ship.

Bark Tacony, 296 tons, old measurement, 13 men, cargo ship.

Ship Sea Bride, 447 tons, old measurement, 18 men, clipper.

Ship Winged Racer, 1767 tons, old measurement, 62 men, clipper, single topsails.

To compare these with more modern ships' crews, their tonnage should be reduced about one-fourth; say, in the case of Winged Racer, she would have a crew of 62 men against tonnage of about 1300.

In 1889, the ship J. B. Brown, of 1400 tons, or considerably larger than the Winged Racer, had a crew of 12 men before the mast or, including the captain, a complement of 17 all told.

In 1905, the ship Occidental, 1534 tons, on a voyage from Seattle to Nome had only 10 foremast hands.

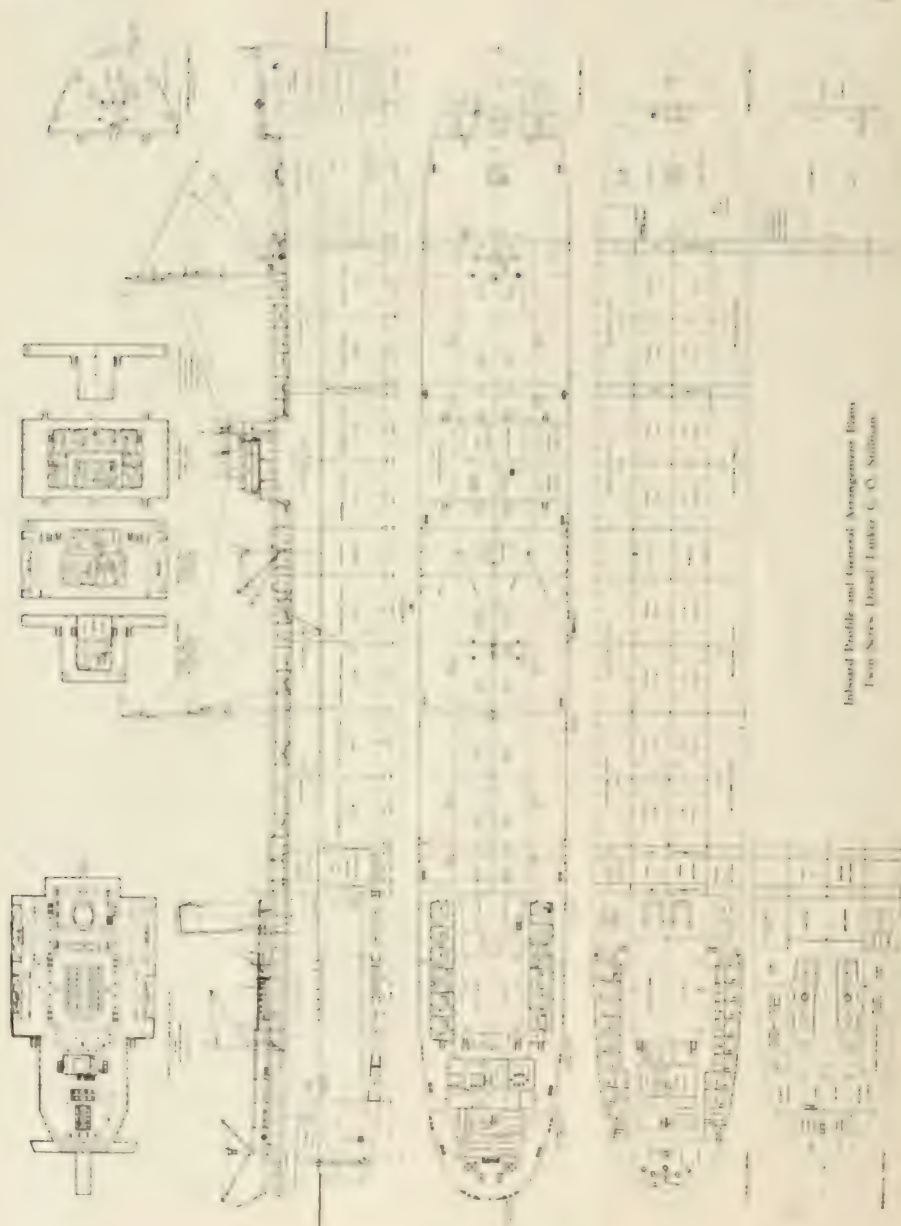
In 1891, the Invincible, about the same size, had 12 seamen, 2 mates, carpenter, cook, and cabin boy, besides the captain, on a voyage from Puget Sound to Australia with lumber.

*Ship Pactolus, built in Maine in 1864; register 1205 tons in 1876, had the following crew on a voyage from New York to San Francisco at that period. Captain, 2 mates, carpenter, cook, steward, 16 men before the mast; total 22 men all told. This was considered a full and proper complement for a ship of that size at that time.

*The ship Shenandoah, four master, built in 1890, of 3405 tons gross, equipped with all labor saving gear then known, had for crew while engaged in Cape Horn work (the hardest voyage known), a captain, 3 mates, carpenter, boatswain, cook, steward, cabin boy, four apprentices, and 24 seamen.

*The extreme clipper Sovereign of the Seas, carrying very large spars, single topsails, no labor saving devices worth mentioning (these not having been invented), had, in 1852, 80 men before the mast and 10 boys. Had the Sovereign of the Seas been afloat in Shenandoah's time, her tonnage would have figured about 1300 tons.

The above will show the difficult in giving a figure of the number of men required to properly man a sailing ship, so much depending on the kind of ship, the date, and trade engaged in.



Internal Profile and Gun Arrangement Plans
Tommy Lee, Draftsman

The Leviathan of the Tankers

Twin Screw Diesel Tanker on the Isherwood Bracketless System Delivered to the International Petroleum Company by the Bremer Vulkan Shipyards at Vegesack, Germany

THERE is now completed at the Bremer-Vulkan Schiffbau und Maschinenfabrik, Vegesack, Germany, the "leviathan" of water borne petroleum transport—the new, 21,350 tons deadweight capacity, bulk oil carrying motorship C. O. Stillman, built by that firm to the order of the International Petroleum Company, Ltd., of Canada. The design and supervision of this new tanker were entrusted to the Marine Department of the Standard Oil Company (New Jersey), now the Standard Shipping Company, as that organization has had such an extensive experience in bulk oil carrier design and construction, and themselves at present having in operation the two largest bulk oil carriers yet put in service, the tank steamers John D. Archbold and Wm. Rockefeller.

The new tanker is a twin screw diesel motor propelled vessel, of the two deck island house aft, bridge and forecastle type, with the propelling machinery aft, and constructed structurally upon the latest longitudinal framing principle (bracketless) as developed under the Sir Joseph W. Isherwood Bart. patents, for the highest classification of Lloyd's Register of Shipping. The vessel has the following dimensions and characteristics:

Length between perpendiculars	565' 0"
Breadth, molded	75' 4"
Depth (molded) to upper deck	44' 6"
Depth (molded) to second deck	29' 6"
Depth (molded), designed operating	31' 0"
Draft (extreme from bottom of keel plate outer straps amidships), designed operating ..	31' 2 3 16"
Draft, extreme to Lloyds summer freeboard (approx.)	32' 4 1/2"
Rise of floor	6"
Radius of bilge	5' 0"
Tumble home (from 30ft. 0in. to 44ft. 6in.) ..	6"
Camber of beam (in 74ft. 4in.)	18"
Sheer at forward perpendicular	10' 4"
Sheer at after perpendicular	6' 0"
Lowest point of parabolic sheer—at mid length between perpendiculars	
Height between decks (molded) at all points from upper deck to the forecastle, bridge deck, and after house tops	7' 6"
Displacement (with shell and appendages to 31ft. 0in. molded water line; at 35 cubic feet per ton of 2240 pounds), tons	31,000
Block coefficient (molded) on length and displacement between perpendiculars to the 31ft. 0in. molded water line	0.8162
Tons per inch immersion (water at 35 cubic feet per ton)	89.6
Designed endurance sea trial speed, for vessel on even level to 31' 2 3 16" extreme draft, knots	11
Estimated effective horsepower, for foregoing trial speed and draft (from model tank results)	2215

Arrangement of Hull

The arrangement of the vessel has received the

careful consideration of the designers, from the viewpoints of economical operation, seaworthiness, maneuverability, reduction of the hazards attendant upon transporting petroleum, and affording those conveniences and appointments for the personnel which tend for safety and comfort.

The vessel has only one complete deck, the upper. The second deck, forming the bottom of the wing or summer tanks, is located at a height of 15' 0" below the upper deck and, in way of the cargo oil tank space bunkers and machinery hatch, extends as a flat outboard of the expansion trunk bulkheads and or machinery space hatch. This deep tween decks in way of the cargo oil tanks space has been arranged to permit of carrying a deadweight cargo of heavy petroleum products entirely within the main tanks, with the wing or summer tanks used when a volumetric or light cargo is carried. The cargo oil tanks total net cubic capacity is such that a complete cargo of 68 degree API product corresponding in weight to the vessel's deadweight capacity may be carried.

The personnel are accommodated in comfortable quarters arranged in the bridge houses, island house aft, and upon the after tween decks; all messing arrangements, including the galley and bakery, being self-contained in a house upon the upper deck, just abaft the machinery casings. All superstructure houses and house tops are of steel, as are the passageway bulkheads within the houses. This has been done to minimize wood and like fire hazardous materials.

Auxiliaries

The deck auxiliary machinery, consisting of a windlass and capstan upon the forecastle deck, two warping winches on the upper deck, one forward, and the other abaft the pump room entrance, two capstans on the upper deck aft, a winch upon the after house top, are all electric motor actuated.

The steering gear is also electrically operated and consists of an electric motor actuated worm and gear driven quadrant, connected to the rudder stock and controlled from the bridge and the after house top by a Ward-Leonard system of electrical control. Manual operation of the gear is also provided in the steering gear space, and for emergency purposes there is a hand wheel operated geared sector and gypsy heads fitted upon the after capstan drive shafts to serve in working relieving tackle.

The navigational equipment is especially complete and includes a Sperry gyro-compass installation. For fire protection a Lux carbon dioxide installation is provided.

Cargo Pumps

The cargo oil pumping system is in keeping with the high class of the other equipment afforded the vessel, and consist mainly of three 360 x 540 x 360 x 610 millimeter packed piston, horizontal duplex compound and or simple stroke governor controlled mechanically lubricated, steam actuated cargo oil pumps, each having a normal rated discharging capacity of 3000 42-gallon barrels of petroleum and/or water per hour, when operating under a steam pressure at the

provements based on the recommendations made by the Marine Department of the Standard Oil Company (New Jersey) were incorporated in the design, that organization having had an exceptionally extensive experience in the operation of diesel motors, particularly the Fried Krupp and Sulzer 2-cycle single-acting types, and were thus able to advance many ideas, the adoption of which has greatly improved the motors for the C. O. Stillman, not alone as regards strength, reliability, and ease in operating, but also as regards simplicity in design and accessibility for overhauling. The motors thus evolved and constructed are designated Type K 6 Z 70/120 Bremer-Vulcan 1926, the symbols K 6 Z 70/120 meaning model K, six power cylinders of 70 cm. diameter, stroke 120 cm., and each has the following general dimensions and characteristics:

Diameter of power cylinders	70 cm. = 27.5"
Stroke	120 cm. = 47.24"
Normal revolutions per minute	90
Shaft horsepower at 90 R.P.M. 2150 at	
	56.2 pounds M.E.P.

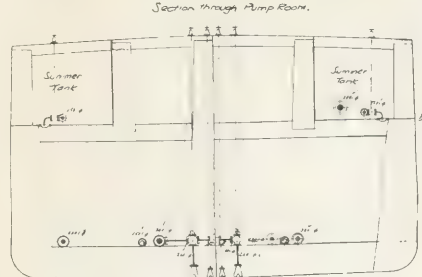
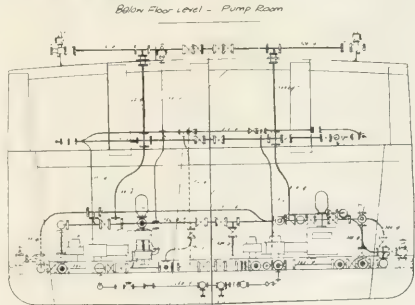
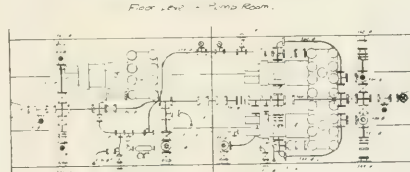
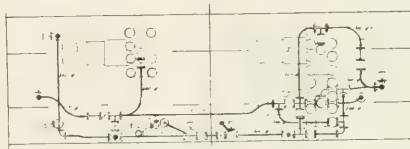
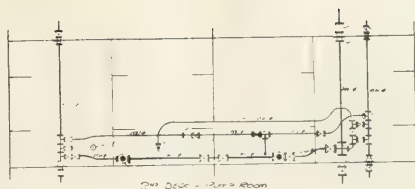
Engine Tests

The first of the motors completed was thoroughly shop tested during the months of October, November, and December, 1926, and January, 1927, and from observations and tests made during that period it is evident that the care taken in design and construction has resulted in a most satisfactory diesel unit. The motor was first tested using a high gravity diesel oil as the fuel; then with standard diesel oil; and later with bunker fuel oil Grade C. Two grades of diesel oil were easily handled, but the bunker fuel oil grade C had to be subjected to purification by centrifuging, and the fuel oil pump and all fuel pipes from the strainers to the fuel injection valves had to be heated to about 150 degrees Fahrenheit to obtain the most satisfactory viscosity of this fuel. The operation of the engine using the purified bunker fuel oil grade C was just as satisfactory as with the diesel oils, but the period of test was not of sufficient duration to afford comparable data regarding relative wear upon the cylinder liners and piston rings. The only alteration made to the motor by reason of and during the tests was that made to the lubricating oil grooves in the main bearings; it was found during the first days of operating the motor that the grooves as originally provided did not afford a proper flow of the lubricating oil, the pressure circuit of oil being through the main bearing seats to the bottom half bush, into the crank shaft bore and by way of the crank web to the crank pin, through the crank pin and brasses up through the connecting rod bore to the crosshead lubricating oil pumps.

The engine was tested direct coupled to a Heenan & Froude dynamometer, and for determining the brake horse power of the motor the dynamometer water flow and the inlet and outlet temperature of the water flow were accurately determined, the results of brake and calorimetric values being quite uniform, with only negligible differences. During January 12, 13, and 14, a 36-hour test of the motor while operating at full and partial loads was conducted, and subsequently a 3-hour overload test was run.

From these test results it is apparent that the motor developed a normal output of 2150 brake horsepower when operating at 90 revolutions per minute, and under these conditions consumed 0.41 pound of fuel oil

(Continued on Page 111)



Plans and elevation of the piping and pump arrangement in the cargo pump rooms of the C. O. Stillman.

of merchant ships which will be suited to American commercial and naval needs. The coastwise trade of this country is not in need of ships. Private operators are handling this trade in such a manner that they have all the vessels needed. Overseas commerce, on the other hand, is virtually at the mercy of the foreign combines, unless Congress does something to build up a privately-owned American merchant marine.

What should be done is to formulate some plan whereby all of the bills introduced on the subject could be "boiled down" into one measure that will accomplish the constructive policy which the country needs. What will be done is another matter. Frankly it doesn't appear as though much will be accomplished this session of Congress. If it should be decided that some marine legislation is absolutely essential at this session of Congress, then the House Committee may haul the Jones bill out of its pigeon-hole and striking out everything after the enacting clause, insert in lieu thereof

the ideas and plans of the other three bills. If such a measure was adopted by the House the Senate would probably disagree to such amendments, automatically throwing the entire subject into conference and so allow the conferees of both houses to draft a complete compromise bill.

This writer has no wish to strike a note of pessimism. Optimism is always a pleasing tonic. But the wise ship operator and the American citizen interested in the welfare of a merchant marine will do well to view the legislative situation on this subject in a pessimistic frame of mind. Any success in obtaining marine legislation can only result from an energetic and continually persistent effort on the part of those who are interested. To avoid disappointment it would seem prudent to conclude that unless the present situation is radically altered the result will be no legislation this session.

The Leviathan of the Tankers

(Continued from Page 109)

per brake horsepower, the mechanical efficiency attained being 0.75.

The motor was tested with overloads up to 30 per cent, and for revolutions up to 125 per minute, at which overloads and revolutions there was no perceptible vibration, and the combustion was entirely satisfactory. Due to the capacity limitations of the dynamometer the motor was not tried at greater powers or at higher revolutions than the foregoing. The lowest revolutions at which the motor was tested was about 25 revolutions per minute. The test results were considered to be quite satisfactory, especially in view of the fact that the actual flywheel for the unit had not been installed, only a light temporary one, to accommodate the turning gear and the rotor of the dynamometer and affording a means of taking care of the torque fluctuations. The maneuvering gear proved to be very reliable and easily manipulated, a false maneuver being practically impossible. The amount of air required for starting is exceptionally small. From tests made, using two starting air flasks of 185.4 cubic feet total capacity and 583 pounds per square inch initial pressure, the motor was completely reversed and put into action 15 times without replenishing the air in the test flasks, which air at the end of the 15 reversals had a pressure of 114 pounds per square inch. As the motorship C. O. Stillman is to be equipped with

six such starting air bottles, and the air is to be stored at 924 pounds per square inch pressure, the installation should be sufficient for at least 50 successive starts, without refilling the flasks. Each attached compressor is of sufficient capacity to afford the full load injection air requirements of two motors. With full load on one motor during tests, the suction side of the first stage of the compressor was throttled about 45 per cent.

The attached scavenging pumps are of greater capacity than required for full load operation of the motor, having an excess capacity of about 45 per cent, figured on scavenging pump—power cylinder stroke volume. With the M.A.N. patent port scavenging a scavenging air excess of 25 per cent of the power cylinder stroke volume is deemed a sufficient surplus. The excess scavenging air is quite advantageous in that exhaust gas temperatures are comparatively lower and the motor's maneuvering qualities are bettered. Each of the two scavenging pumps is provided with two equalizing pipes having a hand operated slide valve and so arranged that the equalizing pipes may be entirely opened or partially closed as required, to afford the most favorable conditions of scavenging air and exhaust gas temperatures. As the C. O. Stillman is to be equipped with exhaust gas boilers, this ready control of the exhaust gas temperatures is essential.



The tanker C. O. Stillman at anchor off Vegesack just before her trials.

Model Conditions on Dredge A. Mackenzie with McIntosh and Seymour
Engines, Westinghouse Electric Apparatus and De Laval Fuel and
Lubricating Oil Purifiers

A black and white photograph of a large industrial machine, likely a steam engine or turbine, with a large flywheel and various mechanical components. A group of people are standing in the background, observing the machinery.

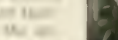


Fig. 1. Epigynum.

A black and white photograph showing the interior of a ship's engine room. The space is filled with large, complex machinery, including several large horizontal cylinders and various pipes, valves, and structural beams. The lighting is somewhat dim, and the overall appearance is industrial and cramped.

It may be remembered that the dredge A. Mackenzie, built by the Sun Shipbuilding Company, was put into service in 1921. It was a 200-horsepower machine 225 feet long with a beam of 40 feet and a draft of 10 feet. The generating equipment consisted of two Westinghouse 250-volt, 275-revolution-per-minute generators, 225-horsepower Westinghouse propulsion motors operating at 110 to 240 volts. The dredge pump is driven by an 800-horsepower motor at 135 to 160 revolutions per minute. The variable voltage control for the main pumps and propulsion circuits and the complete auxiliary equipment, consisting of over seventy motors, together with the generators and main motors, are of the Westinghouse manufacture.

The diesel engines, generators, motors, and pumps are enameled stone grey, trimmed and decorated with black enamel. All iron work is appropriately

polished. Valve wheels have bright polished rims and red spokes. Starting and control boxes are painted stone grey, trimmed in black at the hasps and on areas exposed to the touch of hands. Each box is stenciled to designate its office. The drain pans of all pumps are painted black and kept perfectly dry by the use of copper drips under all stuffing box glands. The gratings are covered with red-painted canvas runners which add a pleasing color effect. Maintenance and upkeep are accomplished on a definite schedule and daily routine with a very small engine room crew.

An analysis of the operating conditions existing on the A. Mackenzie outlines model diesel engine operation briefly as follows:

1. Tight valves properly adjusted and set.
2. Elastic piston rings and proper compression.
3. Controlled exhaust temperatures.
4. Regulated cooling water.
5. Clean fuel oil.
6. Careful lubrication.
7. Intelligent observation and accurate records.

The above are all interrelated and together spell Efficient Operation.

For good diesel engine operation it is absolutely essential that the high pressures and high temperatures encountered be controlled in their flow and action by tight valves properly adjusted and set.

Proper compression is necessary for efficient combustion and is guaranteed by elastic piston rings and tight valves.

Controlled exhaust temperatures are an index of the correct rate of combustion. The measurement of exhaust temperatures is obtained on the A. Mackenzie by Brown electric pyrometers. In Figure 2 the thermocouple is shown inserted in the exhaust pipe passage close to the cylinder head. Calibrated wires lead to the instrument box located on the right hand bulkhead. This instrument is arranged with selective terminals to indicate the exhaust temperature of any given cylinder. The parts subject to damage by moisture and dust

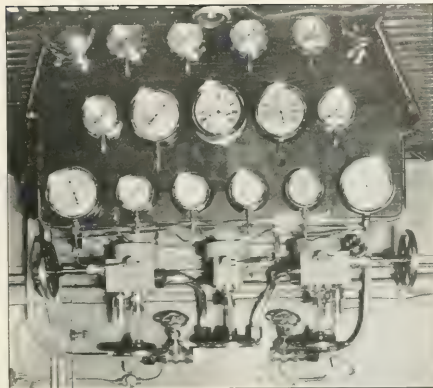


Fig. 3. Gauge board over injection air bottles, showing pressure indicators for two engines.

are entirely enclosed in a sealed box with a glass door. Figure 2 also shows the thermometers placed at the circulating water outlets from the exhaust valve cage. These thermometers are placed in such a position that the operator can regulate the amount of cooling water entering any given cylinder by controlling a valve similar to that shown in Figure 2 between cylinder heads Nos. 1 and 2.

The exhaust temperature and cooling water temperature designate the loading imposed on any cylinder. The observation of these readings in conjunction with the indicator cards give the equality of loading of all cylinders and determine the regulation of each cylinder. The circulating water used in the engines for jacket and piston cooling is sea water. When dredging at slow speeds, considerable sand and silt pass through the cylinders, heads, and pistons, making it necessary to clean out these passages with fresh water at high velocity. In Figure 1, are shown connections on the side of the cylinder head where fresh water is forced over the surface of metal adjacent to the combustion chamber to wash off sand or sediment which may have collected. The pistons have similar connections for the introduction of fresh water to force out any accumulations of solid material in the pistons or piston cooling tubes.

Clean fuel oil is necessary to insure tight valves, elastic piston rings, and reduced liner wear. The most highly refined diesel fuel oil contains some foreign matter which is undesirable inside of a diesel engine cylinder. To properly prepare the fuel oil for combustion, the dredge A. Mackenzie is provided with two No. 600 De Laval vapor-tight purifiers. These purifiers remove one pound of incombustible solids from every 16½ barrels of 24 degree Baume fuel oil. In a day's operation four pounds of solids are removed from sixty-five barrels of oil. The diesel fuel oil is heated in an electric heater, provided with immersion type elements, to a temperature of 140 degrees Fahrenheit before entering the purifier. The installation of these vapor-tight De Laval purifiers is provided with cross connections, so that the purifiers may be used on either fuel or lubricating oil as shown in Figure 5.

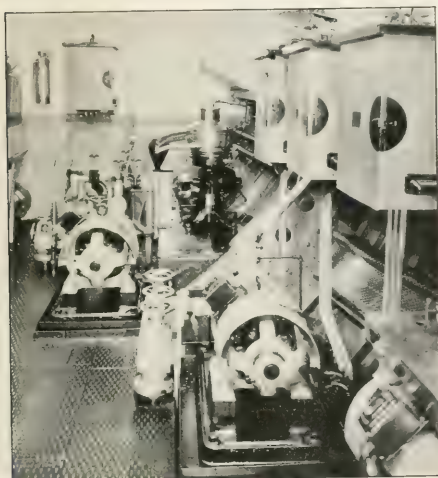


Fig. 4. De Laval lubricating oil purifier in after engine room removes water, carbon, and solids from the used lubricating oil.



Bath Iron Works Reopens

ONE of the cheerful notes in connection with the present decline in American shipbuilding is the recent opening, after two years of inactivity, of that famous Maine shipbuilding plant, the Bath Iron Works.

This yard has been taken over by a new corporation headed by William S. Newell as president and general manager, and has obtained contract for one yacht of notable size, with several more in the design stage. William S. Newell spent twenty-three years at the Bath Iron Works before the closing of that plant, the last eight years in the capacity of works manager. For the past two years, he has been with the American Brown-Boveri Electric Corporation of Camden, New Jersey, in the capacity of chief of design, a position which he resigned to go back to Bath. He is a mas-

ter of the theory and practical application of the art of naval architecture, a member of the American Society of Naval Architects and Marine Engineers, of the Institution of Naval Architects of Great Britain, the American Society of Naval Engineers, the United States Naval Institute, and the Engineers Club of New York.

Associated with Mr. Newell is Archibald M. Main, as vice-president and naval architect. Mr. Main is a graduate of Glasgow, specializing under the famous G. L. Watson as yacht designer. For some years he had been associated with such plants as the Eastern Shipbuilding Company at Groton, Connecticut, and Harlan & Hollingsworth, Wilmington, Delaware. During the war he was president and general manager of the Merrill Stevens Co., Jacksonville, Florida.

The general superintendent in charge of the yard at Bath is Roland F. Hill, who has had very wide experience in Eastern yards in the construction of submarines, torpedo boats, yachts, and commercial craft of all sizes and types.

The Bath Iron Works has long enjoyed a reputation for building pleasure craft. Here was built the famous Aphrodite for Col. Oliver H. Payne, the largest pleasure yacht ever built in this country, with an over-all length of 304 feet and a displacement of 1823 tons. It was here that the cruiser yachts Winchester for Peter W. Rouss, Isabel for John N. Willys, Virginia for Isaac Stern, Pantooiset for Colonel A. S. Bigelow were built. Much work was done also for the United States Government, including the battleship Georgia, the cruiser Cleveland, the monitor Nevada, the gunboats Castine and Machias, and numerous torpedo boats and destroyers.

The yacht at present under contract is for Edward B. Dane of Brookline, Massachusetts. She is to have twin screws, with diesel engines. She will have an over-all length of 240 feet, molded beam of 36 feet, and draft of 14 feet 6 inches. The yacht is from the designs of Henry J. Gielow, Inc., of New York.

Widespread interest has been created by the reopening of this plant, and shipbuilders and lovers of the sea from all parts of the United States are wishing Mr. Newell and his associates the best of success.

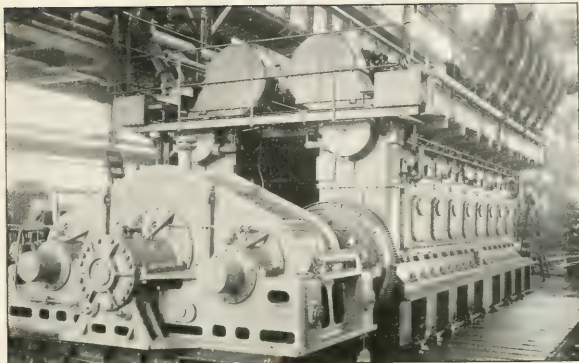


One of the many United States torpedo boat destroyers built at the Bath Iron Works.

minute astern.

On the Herman Falk, an auxiliary diesel electric generator is installed, the engine being Falk 3-cylinder, 450 revolutions per minute, 165 brake horsepower. This engine is the first of the kind designed and built by the Falk Corporation. It has run continuously with no trouble whatever.

For heating the heavy oil in the cargo tanks, one of the original boilers was preserved in the ship. As a steamer, whenever the heating of the cargo began at sea, the geared turbines were short of steam and the vessel lost considerable speed. Now that the heating plant is independent of the propelling plant, the ship gains nearly a full day on the return trip from Tampico to her home port. As equipped with this diesel installation, the Herman Falk is practically vibrationless.



Close-up view of the forward end of the Falk diesel propulsion unit showing gears, bearings, and one of the Falk-Bibby flexible couplings.

At no point in the ship can vibration be noticed at full speed, either under full cargo or ballast conditions.

The Diesel-Electric Conversion of the Freighters Triumph and Defiance

THE award of contract to the Westinghouse Electric and Manufacturing Company for the complete electrical equipment of the Shipping Board freighters Defiance and Triumph, which will be converted to diesel-electric drive, is announced by the Westinghouse Electric and Manufacturing Company. The Defiance will be converted at the Norfolk Navy Yard and the Triumph at the Boston Navy Yard.

The vessels are to have their present 3000 shaft horsepower steam propelling machinery and steam auxiliaries removed, and 4000 shaft horsepower diesel-electric propelling machinery with complete electric auxiliaries installed. This increase in the propulsive horsepower, with changes to be made in the bow and stern of the vessels to improve their stream lines, and a new propeller designed for 60 revolutions per minute, are expected to give the freighters a speed in excess of 13 knots, as compared with their former speed of 10½ knots. Plans and specifications for the conversions were prepared by Gibbs Bros. Inc., of New York, with the cooperation of Admiral D. W. Taylor, and all work in connection with the conversions

is under the supervision of Gibbs Bros. Inc.

The electric form of propulsion was decided upon in preference to a direct drive diesel engine, largely because of the saving in cost, weight, and space in favor of the electric drive where comparatively low propeller revolutions are desired. Careful comparative studies of the electric and direct drive forms of propulsion showed that many advantages would be derived not only in the installation, but also in operating features of the vessels to be converted.

The vessels will be driven by a 1500 volt double armature, direct current, forced ventilated motor of 4000 shaft horsepower at 60 revolutions per minute, which is directly connected to the propeller. Power for the propulsion motor will be supplied by four main generator sets, each of which comprises a McIntosh & Seymour diesel engine, directly connected to an 800-kilowatt, 250 revolutions per minute, 375-volt main generator and a 100-kilowatt, 240-volt, direct-current auxiliary generator and exciter.

The Westinghouse variable voltage propulsion control equipment will be installed with dead front

control panels and arranged for both pilot house and engine room control.

All deck auxiliary machinery will be electrically driven and will consist of one warping and twelve deck winch water-proof motors of 25 horsepower, and one water-tight anchor windlass motor of 65 horsepower. The magnetic brakes and master controllers of the deck motors are all of water-proof construction.

The steering gear will be driven by a 45 horsepower motor operating on the variable voltage control system. The control is so arranged that the vessel can be steered automatically by means of a Sperry "metal mike" or manually from the bridge or after station.

Motors and control will be furnished for driving all engine room auxiliaries electrically.

Power for auxiliary machinery when the vessel is in port will be taken from one of the main generator units thereby making the installation of an auxiliary generating plant for this purpose unnecessary. A 36 kilowatt diesel driven generator is supplied for stand-by purposes.

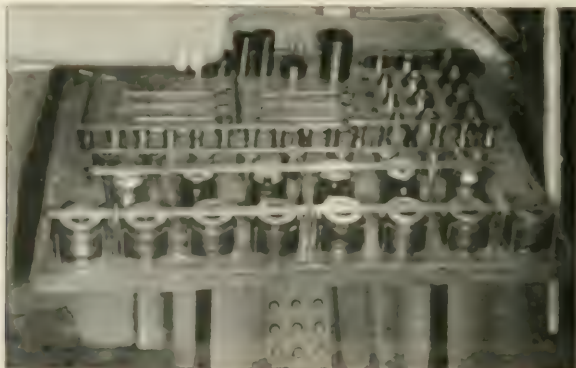
A Department Devoted to Marine Engineering from the Standpoint
of the Operating Platform

SPARE enters the lower ranked 100 countries suggested below, close to 100th. These often represent the least developed and are generally the least interesting to most of our readers. In fact, they are the least interesting to most of our readers. In fact, they are the least interesting to most of our readers. In fact, they are the least interesting to most of our readers.

to make the digger's work easier, around the corner of the house or against the concrete water pipe in the yard. The use of a movable corner, 15 to 20 in. long, particularly in an emergency, dig out concrete (Vib) and sand (S) and with heavy, automatic workings, gives the value for the same, and around the driveway and other walls and sand.

has devised a very effective arrangement for the main air compressor valves. The accompanying illustration shows this arrangement for the valves in the layout of the main air compressor valves completely assembled and ground, also the valve lifts adjusted, with just enough protective coating to keep them from rusting. Any one of these valves can be released from the board, returning to the original position. The main air compressor contains the suction and discharge valves for the intermediate pressure stage, and the third row the suction and discharge valves for the high pressure stage of the main air compressor. The fourth row contains the valves for the auxiliary engine air compressors. Starting with the valves arranged on the upper right hand corner of the board. High pressure piston rings and pulling tools are placed on the upper part of this board.

All of the valves have been ground to their seats. The valves and seats were separately brought



Read *For your future and your name* directed by Oliver Foy, over Jane Martinson

down to a true surface by grinding
with a fine sand paper, such as 120
grit. After the faces are
true, the
fine grinding compound. The
brass polish and soapstone. In this way an extremely smooth, true surface

The valves and seats were then assembled and leads of a thickness equal to the proper valve lifts were placed between the seating surfaces. The assembled unit was

then chucked in a lathe and the back of the valve faced down so that the proper lift would be obtained when installed in the compressor.

A board similar to the above can be made and equipped by any engineer during spare time and will amply repay all efforts expended. More time is usually consumed in checking up a diesel engine in port than is required by steam. Spares accurately fitted and ready for use will minimize work in port and provide protection at sea.

At the November 17 meeting of the North East Coast Institution of Engineers and Shipbuilders, S. G. Vicker, of the Netherlands Steamship Company, read a very interesting paper describing the conversion of the company's steamer Borneo from an ordinary triple expansion, superheated 180-pounds steam job into a high pressure installation.

Water-tube boilers of the Hawthorn-Armstrong type were used. These boilers delivered steam at 500 pounds pressure, 750 degrees Fahrenheit. They are fitted for coal burning, with mechanical stoking.

The engine was changed only as to cylinders, pistons, valves, valve mechanism, and connections. New cylinders were 17¼, 26, and 69, by 54-inch stroke. The high pressure

cylinder is built up of three parts; central cylindrical part of high tensile cast iron, upper and lower parts of cast steel. The stuffing box on this cylinder has three different kinds of packing. A simple labyrinth next the cylinder (cast iron rings alternately fitting on the rod and on the box); then segmental cast iron rings held to a fit on the rod by spiral springs; then a set of United States metallic packing. Between the second and third packing an open space is left and this is connected by pipe to the intermediate receiver to create a back pressure on the cast iron rings and labyrinth. Lubrication of the high pressure cylinder is by injecting water from main feed pipe into main

steam pipe just before the stop valve.

Old auxiliaries were left in the ship and are operated by steam from the intermediate chest.

The engine is of 3600 indicated horsepower. On trials, consumption for all purposes shows 1.13 pounds of coal per indicated horsepower hour. Heat value of coal 13,410 B.T.U.

This vessel has completed one round trip satisfactorily. At the end of three round trips the company will consider it has sufficient data to determine whether it is worth while to build a new steamer with this type of plant. Many additional economies would, of course, be possible in the new steamer.

the maligner was at once told where to head in.

The writer was a passenger on one voyage of this steamer coming north from Panama. About off Pigeon Point a liner worked loose from under the high pressure cross head guide. It was only about a sixteenth of an inch thick, but the lack of it made the engine slam heavily. While not dangerous, it was disagreeable.

The chief, who had a good record for never stopping his engines at sea, went to the captain, told him of the trouble, and asked that when the vessel reached the station off the Bar, with a stop made to take the pilot, that the "go ahead" signal be held for a minute.

However, there was another passenger on board who claimed to know all about engines, and he busied himself by telling the rest of the passengers it was very dangerous to run the engines that way, and that a stop should be made for repairs. I suggested that it was perhaps probable that the chief knew his business, but nothing would do this busybody except to go to the captain and state his views. The "old man" heard him out, and replied:

"Say, mister, you may be an engineer, but you have no authority on this vessel. The chief has told me everything is all right, and I trust him. So please keep your advice until asked for."

We soon reached the pilot station and the old girl was slowed and stopped. Knowing the chief well, I took the liberty of looking into the engine room to see what would be done. The chief took the reverse gear himself, and while holding her with by-passes, the third assistant jumped into the crank pit, salvaged the liner, and was out in a flash. The first assistant had all ready, and the chief gave her steam under the high pressure piston in the go astern motion, thus putting the shoe pressure to that side. The liner was slipped under the go ahead shoe, the plate and bolts put in and in less than two minutes the job was done. The chief turned the gear over to the first assistant and strolled up on deck, arriving there just as the pilot came over the side. A wave of the hand to the captain signalled all "O.K." below, and as the pilot said "slow ahead," the engine began to turn over with its regulation smoothness.

The Tight Corner

Loose Follower Bolts

(Your new department, "In a Tight Corner," is O.K.; lots to learn; here is what happened on a big ocean liner I was engineer of not so long ago.)

THE engineer on watch heard a knock in one of the cylinders, the second intermediate pressure, by the way, and as the knocking was getting worse, he notified the chief, who gave orders to stop the engines right away, this being the starboard engine. Jacking gear put in, brake on shaft put on, while the engine was opened out, and manhole cover taken off to let a man down to locate the trouble.

First assistant proceeded down into the cylinder and found most of the follower bolts loose. Tools were gotten out, coconut mats to stand on down there, electric blower kept going to circulate air.

When I was going on watch, not knowing the engine was stopped, I naturally went over to see what they all were standing around looking at. Just then they were pulling the first out, soaking wet and red in the face like a boiled lobster from the heat. The chief then went down and not seeing anybody offering to go with him, I sent word to the engineer on watch where I was, and

then went down into the cylinder to give the chief a hand. It was pretty hot inside, and they kept the blower right on us instead of blowing on one side. I tried to holler up to them, but they couldn't hear me. So we kept on working until finished with setting up on all bolts.

There was an awful din in there. I couldn't understand why we couldn't hear one another when hollering. Well they pulled us out, and I sat down for a blow before going down to relieve the watch. When all of a sudden my feet started to burn. Having heavy soles on my shoes I didn't feel it in there, so I was walking around on my heels for a couple of watches with blisters under my feet. Afterwards I found out why none of the others would go down. They told me we took an awful chance going into that cylinder with the port engine running wide open and only an old brake and a jacking engine holding it. Outside you always had a chance to jump to one side if anything had given way, while we would have been flattened out like pancakes. But we never gave a thought to that until it was all over.

But that's all in the game.

Well, the engine was started up again and ran good all the way.

Cooperation and a Loose Liner

THE chief engineer and the captain of one of the old Pacific Mail Steamship Company's boats were great friends.

Their loyalty to each other was proverbial among the waterfront folks. If anyone made a disparaging remark to one concerning the other,

The First Leviathan

Some Accurate Data Concerning the Transatlantic Freight and Passenger
Liner Great Eastern

By C. E. Motters

THE GREAT EASTERN, the largest ship ever built, was built at Millwall in 1854.

About 1852, I. K. Brown proposed to the London Navy Agents to construct the construction of a shipyard for the Indian and Chinese trade. From time to time the idea of building a shipyard in London was revived, but it was not until 1852 that a vessel of the dimensions proposed for the Great Eastern was built. The ship was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built.



The interior of the Great Eastern, showing the hull and the machinery of the ship.

crew engines and their machinery. The first plates of the great ship were laid on May 1, 1854, and she was launched on January 31, 1859.

Her model followed the lines of the Great Eastern, and was built at Millwall in London. The ship was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built.

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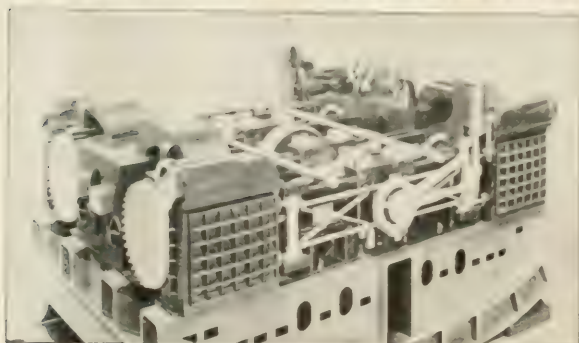
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Accommodation for passengers: first class, 1,000; second class, 2,000; third class, 1,200; or as a troopship she would carry 10,000 men.

She had five funnels and six masts, which could spread 6,500 square feet of canvas. She was fitted with 20 anchors, which, with their cables, weighed 253 tons.

The Great Eastern was launched sideways into the Thames three months after the first attempt. She weighed at the time 12,000 tons and rose to the surface in 10 minutes. She was 400 feet long, 65 feet wide, and 35 feet deep. She was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built. The ship was built at Millwall in London, and was the largest ship ever built.



The 4-cylinder, 4886 indicated horsepower screw propeller engines of the Great Eastern, 84 inches diameter by 48 inches stroke.

by the application of extensive hydraulic machinery. These troubles caused financial difficulties, which stopped the work, so that it was only in September, 1859, that the trial trip took place. Her first voyage across the Atlantic was made in June 1860. The greatest speed attained during the passage was 14.5 knots. Her average speed was 14 knots, and coal consumption 12.5 tons per hour. She, however, did not pay either as a passenger or a cargo steamer; but, from 1865 to 1873 was extensively engaged in laying submarine cables with considerable success. After this she did no useful work, and in 1888 was sold as old metal, and broken up in the two ensuing years.

Displacement, 27,385 tons; tonnage, gross, 18,914; length on the upper deck, 692 feet; length on load water-line, 690 feet; breadth, extreme, 82.5 feet; breadth across the paddle-boxes, 120 feet; depth at side, 58 feet; depth of hold, 24.2 feet; draught of water (laden), 30 feet; area of immersed midship section, 2204 square feet; coal capacity, 10,000 tons; cargo capacity, 6000 tons.

Until 1888-1890, when she was dismantled and broken up, she was the largest vessel afloat, nor was it until 1899 that her dimensions were exceeded.

The paddle engines were designed and constructed by John Scott Russell & Company, and were of the oscillating type, of 1000 nominal horsepower, but indicated 3411 horsepower; the weight of the engines was 836 tons. The cylinders, four in number, were 74 inches diameter by 14 feet stroke, and the mean number of revolutions was 10.75. Two of the cylinders drove one crank, and the other two a crank at right angles on a built-up paddle shaft. There were two air pumps, driven by a single crank on the intermediate length of the paddle shaft, and there were two independent condensers and reversing gears; so that each paddle-wheel was driven by a complete cylinder engine that could be run alone if required. The cylinders were inclined at a mean angle of 22.5 degrees from the vertical and on opposite sides; so that a fairly uniform turning moment was obtained with a single pair. The condensers were of the jet type, arranged under the shaft and between each pair of cylinders. The vacuum maintained was 25.5 inches. The slide valves were of the gridiron form, with back relief frames; to reduce the length of the steam passages, the two ends of each cylinder were supplied by separate valves.

Steam at 24 pounds pressure was

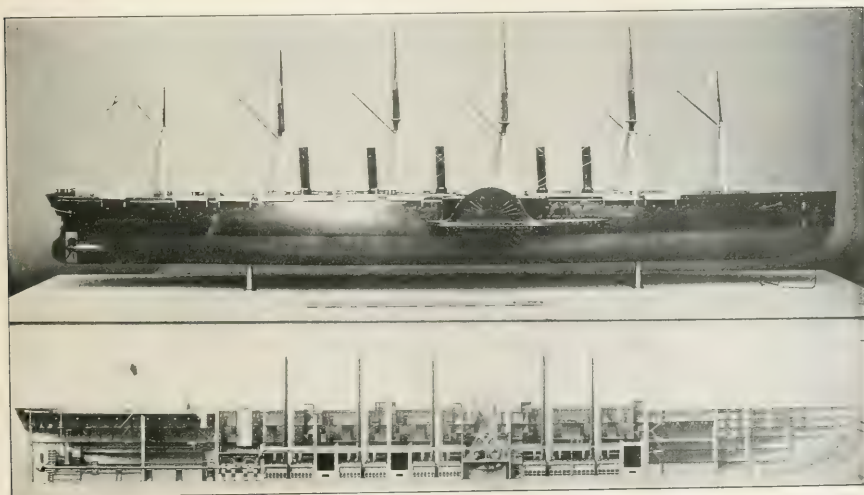
supplied to the paddle engines by four double-ended tubular boilers of the rectangular or box type, each 17.5 feet long, 17.75 feet wide, and 13.75 feet high, with 40 furnaces and 4500 square feet of heating surface. Each boiler weighed 50 tons and carried about 40 tons of water.

The original paddle-wheels were 56 feet diameter and weighed 90 tons each. The paddle shafts were connected to the engine shaft by powerful friction clutches, so arranged that each could be released or closed by gearing as occasion required; the elaborate power-driven disconnecting gear shown on the model was, however, never actually fitted. These wheels were destroyed during a gale in 1861; the new ones fitted were much stronger and only 50 feet diameter, while the floats were also narrower; these wheels were on the ship when she was broken up.

The calculated speed of the vessel, with both screw and paddle-wheels working, was 15 knots; a special trial of the ship under paddles alone gave a speed of 7.25 knots.

The two balance weights on the model were added in 1895, when it was first shown in motion and did not exist in the actual engines.

(Continued on Page 39, Adv. Sec.)



A model of the Great Eastern and her inboard profile.

Pacific Workboats and Their Power Plants

Some San Francisco Bay Notes

Anderson & Christensen's yard at
Hansen's Point. They also noted the
large hole where the ground was broken,
which contained some grass, but very
little. Another hole was found and containing
some clothing and other things, but not
changed to the current state. There has
been some discussion about the
possibility of a large hole.

The great May Gullies, open in Sweden, had formed in half a million years. In having a very high, almost vertical, north-eastern cliff, the gullies are the best of the kind in the world. The gullies are 100 to 200 feet deep, and 10 to 20 feet wide at the top. The gullies are 100 to 200 feet deep, and 10 to 20 feet wide at the top. The gullies are 100 to 200 feet deep, and 10 to 20 feet wide at the top.

By 1990, nearly 90% of the world's population lived in the third and fifth positions, and nearly 80% of the world's population lived in the third and fifth positions.

12. Ψ is the Ψ -function defined by the Ψ -functionality (see Definition 10.1.1), computed with the Ψ -functionality (see Definition 10.1.1).

George W. Jones Company's 1997 and 1998 model lines of general purpose snow, cigarette, utility, and lawn mowers, including the popular 2000ZT, 2115, and 2125 models, are being shipped out to customers. Request the literature today.

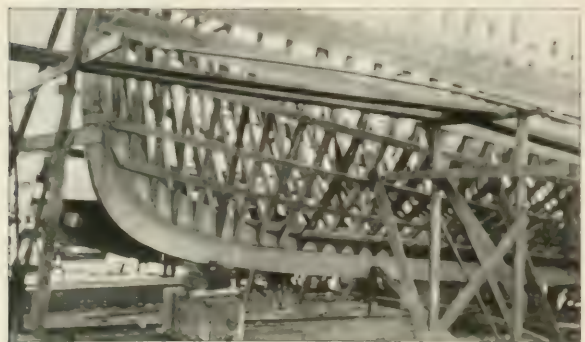
John Twigg & Sons are building a new settlement centre here, concentrating on young people in 1990.



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moving the glass. Prisms will be used to bend light beams. Two lenses will bend and focus the light beams into thin slivers to give maximum light strength. These lenses will serve the function of focused cylindrical lenses on microscopes. They'll be known as the "collimator" and "focuser" lenses.

Most Engineering Magazine, September and October drawings of the Madden & Lewis yard. Madden is probably the only large working yard in existence on the Pacific



Part of the frame of one of the two to-be-built fishing boats now building at the Madden & Lewis Yard for the Mirandillo Fish Company of San Francisco. Each of these boats will be propelled by a 155-horsepower Washington-Estep diesel engine.

Capt.

 The bird that was shot last week, early, with some other species, was a young male, in the early stage of the breeding season, with a small amount of red on the head.

A view of one of the two houses built by the post office. There were two and quite large. There were also two barns and a few outbuildings. The houses were built of adobe brick and were quite comfortable. The houses were built by the post office and were quite comfortable. The houses were built by the post office and were quite comfortable.

TRISCO STANDARD IN PACIFIC NORTHWEST

THAT's the way to it, says an experienced tug engineer. "The Marine Transport Company of Seattle, Washington, has the best record in the world when it comes to getting its boats and other gear out in heavy weather and in the roughest waters. The Marine Transport Company of Seattle says that the reason for the better record is that they don't try to force weather during the past season. They were waiting in Alaska and Puget Sound districts, and are said by the company to be getting splendid results in economical and steady operation."

St. Matthews, the Merritt, built for the Halibut Cove Halibut seiner; and the Glacier, also a seiner, built for Steve Separovitch of Gig Harbor. The two latter craft were built by Skanzie Shipbuilding Company of Gig Harbor. The Anarcite and Iceland, purse seiners, built by Western Boat Co. of Seattle, Tacoma, for Peter Rodashev and Paul Matinis of Everett, are propelled by Standard gas engines. So also is Guy Junior, built by Lake Washington Shipyards, Houghton, for Libby, McNeill & Libby, Seattle. This is one of the new work job, shallow draft, tunnel type, used in Alaska waters. The Vinodal, built for the Guy Youngs of Seattle, halibut fishermen, by Olson & Sons, has a Standard engine.

All these units are of the new Standard 50-horsepower type. Many of the Slavonic and Italian fishermen swear by the rugged Standard.

Gray's Harbor Notes

The building and operation of workboats to attend to the docking of steamers and towing of scows laden with lumber has become quite a business at Grays Harbor. The **Allman-Hubbel Tugboat Company** operates eleven boats. Eight of these are steam powered and three diesel powered. **Atlas-Imperial** engines are installed in two and **Washington-Estep** in one. These three diesel engine tugs are said by Captain Frank Hubbel, manager, to be very efficient, upkeep and operating costs being very much less than the steam propelled workboats. For some work he still prefers steam, even with its higher costs.

One of the steam powered craft is the Tyee, built at Hoquiam. She is a powerful vessel for her size, and easily handles the big hulls of the lumber freighters.

F. W. Thurber of Hoquiam has had built recently a staunch little workboat, the Union, engined with a 50-horsepower **Atlas-Imperial** diesel engine. This craft is used mainly in moving barges and lumber scows and is kept busy all the time.

Her owner is planning additions to his fleet.

R. J. Ultican Tugboat Co. of Aberdeen operates five vessels, one powered with **Fairbanks-Morse** diesel engine; two with **Atlas-Imperial** diesels; one with a gas engine; and, one, a heavy tug, is steam powered.

Chillman Shipyard and Engine Works at Hoquiam is a close corporation controlled by Ivar Chillman, a Swedish shipbuilder who started the yard in 1904. He has turned out some very staunch vessels, among them the tugboat Tyee. He is agent for the **Union Gas Engine Company** of Oakland for its gas and diesel engines, and has sold around 250 of the gas type. He intends to install a 225-horsepower reversible **Union** diesel engine in a hull now building, and is confident that the new vessel will make a record with this power unit.

The yard is well equipped to build any sort of medium sized craft. It has a complete machine and blacksmith shop in addition to the usual woodworking machinery, with a small brass foundry as well.

Tacoma Notes

J. M. Martinac & Co., shipbuilder at 1404 East D Street, Tacoma, has turned out ten workboats during the past season. These craft were from 28 to 70 feet in length. Among them was the **Ambassador**, built for Captain John Depolo of Tacoma, who will operate the vessel out of San Pedro in the tuna fishing business. The **Ambassador** is 68 feet length, 16 feet beam, with a depth of 8 feet. She is fitted with a 100-horsepower **Atlas-Imperial** diesel engine. The **Ambassador** sailed for San Pedro the middle of September and after a fine run down the coast at once started for the fishing grounds.

Besides these, the yard has on the stocks a new seiner for Captain John Gragolich, a boat of 70 feet length powered with a **Washington-Estep** diesel engine.

This yard keeps a large force of men employed steadily, as the output is of high type. Besides new construction, repairs are taken care of. The yard has a machine and blacksmith shop, so that all classes of work can be done promptly. Mr. Martinac, vice-president and general manager, reports many inquir-

ies for new jobs, with prospects good for continued activity.

Edward E. Johnson, workboat builder, at 2142 East D Street, Tacoma, has completed a very fine halibut schooner, 70 feet length by 17 feet beam. She will have a **Washington-Estep** diesel engine of 135 horsepower and was built for Berger-Edwards of Ketchikan.

Last spring Mr. Johnson built a 73-foot halibut fishing boat, named **El Dorado**, for Hansen and Elling-

sen. This craft has a 150-horsepower **Bolinder** engine and she is claimed to be one of the fastest of the Ketchikan fleet. Her Captain, J. Johnson, reports that with a load of 62,000 pounds of halibut she can easily make 9 knots, a fine speed for a craft built for heavy duty at sea. He is strongly in favor of the **Bolinder**, stating that during a severe season's run there has been no delay or trouble with the power plant. The Johnson yard is not a large one, but turns out fine work, very much favored by the Scandinavian fishermen of the stormy Alaskan seas.

Mojean and Ericson, at 2128 East D Street, Tacoma, have been established only a few years, but during that time have made many friends among the workboat and fishing vessel operators. Both members of the firm are practical builders of staunch craft. They worked for some time in the yards on San Francisco Bay, and, believing that there was an opening at Tacoma for them, started the yard bearing their names.

They recently built an 85-foot by 17-foot tug for the **Magnolia Tugboat Company** of Tacoma, which is propelled by a **Fairbanks-Morse** 240-horsepower, full diesel engine. This vessel has made a very fine record. They also rebuilt the workboat **Katmai** during the past few months, and that craft is now practically new, though she still has her original **Atlas-Imperial**, 150-horsepower gas engine.

In addition to considerable other work, Mojean and Ericson rebuilt during the past few months two yachts, making new teak deck houses and rails. They have complete shop equipment and machinery for carrying out either a repair job or a new one.

Astoria Notes

In addition to the work of building the **Ruth E.**, combination workboat and yacht (described on Page 25 of the January issue), the **Astoria Ship Building Company** has been busy on general repair and some new construction work during the past season. This firm is managed by J. M. Dyer; S. A. Wright is secretary. Both men are practical shipbuilders and naval architects. The yard has recently rebuilt the **Donald Curry**, government cruiser, and the **Eldo**, formerly a naval steamer. A 34-foot troller,

the **Marylynn R.**, powered with a 20-horsepower gas unit, besides four seiners and several smaller boats with general work on the ways, have kept the yard force occupied.

Wilson Shipbuilding Yard at Astoria reports a very prosperous season, with considerable work in view. This yard has recently completed a boomboat for the **Ostrander Railway and Timber Company**, which is 42 feet length, 12 feet beam, and 2 feet draft. She is of the tunnel type and has a 40-horsepower **Fair-**

banks Morse & Company, Portland, Ore.

Another important one has been in connection with the building of a new shipyard at Van Buren, Wash. This work is now being done by the same firm.

Several other firms have been active in connection with Palmer and his associates. The firm of J. H. and J. C. Palmer, of Bridgeport, Conn., has been building a new shipyard at Van Buren, Wash. The firm of J. H. and J. C. Palmer, of Bridgeport, Conn., has been building a new shipyard at Van Buren, Wash. The firm of J. H. and J. C. Palmer, of Bridgeport, Conn., has been building a new shipyard at Van Buren, Wash.

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Astoria Marine Supply Co. of Astoria



Construction of the new shipyard at Van Buren, Wash., by the firm of J. H. and J. C. Palmer.

is the largest firm in the Pacific Northwest. The firm of J. H. and J. C. Palmer, of Bridgeport, Conn., has been building a new shipyard at Van Buren, Wash. The firm of J. H. and J. C. Palmer, of Bridgeport, Conn., has been building a new shipyard at Van Buren, Wash.

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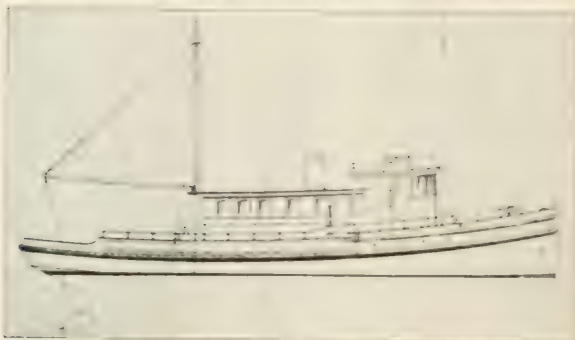
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C. PADGETT HODSON, NAVAL ARCHITECT

C. Padgett Hodson, associated for the past two years with Lee and Brinnon, naval architects of Seattle and San Francisco, has opened an office in San Francisco as a consulting naval architect specializing in the design of sailing and power yachts and workboats. Mr. Hodson had had long experience in Great Britain and on the continent of Europe as a practical yacht builder and designing naval architect in that branch of the profession.

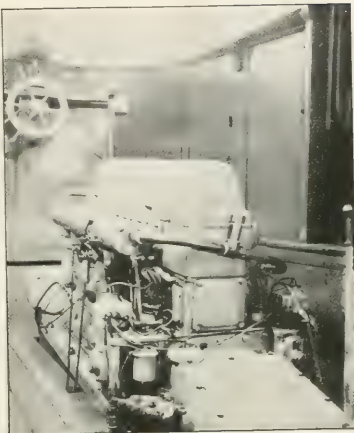


Outboard profile of the Ruth E., a combination yacht and workboat built by the Astoria Shipbuilding Company and powered with an Atlas-Imperial 140-horsepower diesel engine.

A Fast Workboat

PROBABLY the fastest workboat on San Francisco Bay is the Sea Gull, operated by the San Francisco Launch & Towboat Company. This vessel, 45 feet length by 9 feet beam, was built by Nunes Brothers, Sausalito, and is propelled by a 6-cylinder, 125-horsepower Sterling gas engine, which, at 1450 revolutions per minute, gives a speed of 17 miles per hour.

The firm owning her is a close corporation, composed of Messrs F. Foppiano and L. Davidson. Both of these young men are "waterfront" boys, and know how workboats should be handled. Though in business a comparative-



Sterling 125-horsepower gas engine on the Sea Gull.



The cruiser Sea Gull, said to be the fastest workboat on San Francisco Bay.

ly short time, they have already four workboats in their fleet. The Sea Gull, the Marion, the Two Brothers, and a small "line boat", which fits in on many little jobs where a big one would be too costly to operate.

The Sea Gull is very often en-

gaged by the Matson Navigation Company when fast service is required and has also proved a favorite with visitors to man-of-war row and excursions. Photographs of her engines and the hull are shown here.

Frisco Standard Gas Engine

By Robert E. Seymour

WHEN a gas engine has met with an amazing sort of success over a long period of time one instinctively wishes to know what manner of manufacturing genius was placed into the engine in the first place to give it such widespread popularity. That, at least, is what one thinks when

the "Frisco Standard" gas engine becomes the topic of conversation in fishing circles, not only on the Pacific Coast, but in all parts of the United States. The writer traced recently the origin of this engine and found a most fascinating story of business and manufacturing skill.

Twenty-eight years ago there was practically only one gas engine company in San Francisco. This concern was functioning more or less efficiently and enjoying a rather satisfactory prosperity, until labor troubles, which had been brewing for some time, forced many of the employees out of their positions. Certain of these workers, skilled in their craft, decided to fill in this idle time by starting an engine repair shop. And it wasn't long before their business flourished because each man was using his very best efforts to make it successful. One of the number had been dreaming of a gasoline engine that would be superior to any engine then on the market. He began, in his spare time, to make his dream a reality. His colleagues assisted him in every way possible, and the ultimate result was the creation of a greatly improved engine.

Several of the engines from the original model were constructed, but it was not until Charles Peterson, a widely-known boatman of San Francisco, had one of the engines installed in his craft Barbara that the fame of the present "Frisco Standard" was to become known to every mariner in the world.

The great fire of 1906 induced a transfer of the company's activities to Oakland, and activities were begun in a tent.

During all of this time sales of the "Frisco Standard" gasoline engine, designed originally by Peter Mohrdieck, were being made in ever increasing volume. Its fame and ability to give high-powered and unlimited service were recognized.

At the time the "Frisco Standard" was rising to its eminence, G. W. Emmons was president of the Standard Gas Engine Company. Its other officers were P. Mohrdieck, vice-president and superintendent; James S. Hawkins, secretary; and W. L. Hughson, treasurer. These men—each a genius in his particular field—maintained a vigilant eye toward gas engine improvement. When they detected a new and practical idea it was incorporated instantly into the "Frisco Standard."

A recent visit to the company's Oakland factory develops the fact that the mechanics there are busy manufacturing engines to be distributed not only to the Pacific Coast but to Dunedin, New Zealand, New Orleans, Fiji Islands, Canada, Callao, and New York.

ment is separately insulated so that different kinds of baking can be accomplished in the various compartments at the same time. The oven linings are of heavy steel, steam-tight, but very little heat radiation loss occurs due to the fact that there is practically no through metal from the linings to the outside walls. The decks are made of heavy tile so that heat is held. This stored heat, together with that of the walls, enables a great deal of baking without any current at all and a general economic operation throughout. Automatic temperature controls are also provided for each compartment.

One of the very fine features of this type of oven is the excellent lighting system, which causes a bright light to flood the entire chamber automatically when the door is opened. This light can easily be removed for cleaning, but is amply protected inside the oven to prevent breakage. It operates on the same circuit as the automatic temperature control.

Operating Economy

The operating advantages of electric auxiliary equipment on board ship are now well known. The cost to produce the electricity varies from as low as 0.3 cent per kilowatt hour in the case of large vessels to 0.5 cent and 1 cent per kilowatt hour for smaller units. The off-peak nature of the cooking and baking load on board ships a strong argument for its use. Losses from waste heat make steam heat expensive, and the absence of such losses make electric heat more efficient, and this applies as well to the application of electric heat for cooking and baking. It was found that, while ample provision was made for additional electrical generating capacity on the Malolo to take care of the heavy duty cooking and baking load, one of these generators could actually be shut down due to the above-mentioned off-peak character of the load. This meant an additional economy, for whereas it was expected the electric galley load would amount to approximately 35 per cent of the total electric demand, elaborate tests made on the maiden voyage of the Malolo showed the average galley load only a little over 20 per cent of the total, when the average number of meals served daily was nearly 1800. The peak demand of the cooking and baking equipment came in the morning and tapered off gradually during the af-

ternoon period, so that when the lighting load peak came on in the evening only a little over 15 per cent of the connected load of the cooking equipment was in demand.

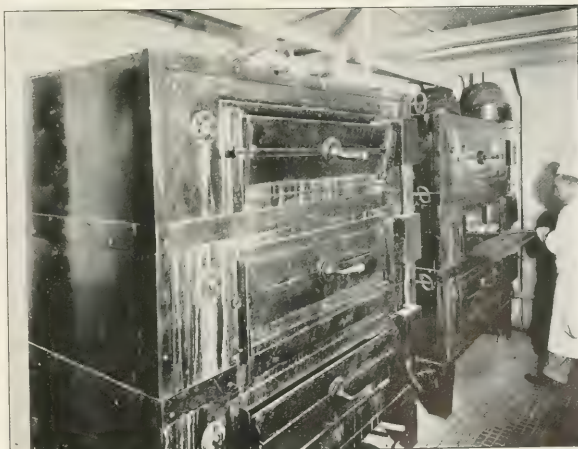
All heavy roasting and cooking is done from 6:00 a.m. until noon, so that practically all of the heavy cooking was out of the way by 4:00 p.m. Short order cooking at the dinner hour causes a slight increase in demand during the serving period, but this is greatly reduced under the morning peak period for heavy cooking. From 8:00 p.m. until 6:00 a.m. all cooking equipment is turned off and only bake oven equipment operates during the night watch. The above operating conditions have been found to be most practical for ship operation, and, judging from the excellent showing of this installation, can well be recommended in the future.

Though the equipment installed on the Malolo has a capacity for cooking 100 per cent more meals per day than were served on the maiden voyage, all ranges and ovens were in daily use and heated the same as if the galley had been operated at maximum capacity. No attempt was made to cut down certain units of equipment due to the limited passenger list, and it is conservative to state that at least 200 additional meals could have been served daily without consuming any more energy. The estimated current cost per person per meal was only about 0.8 cent, practically

a negligible figure. The significance of this amount is still more apparent when one takes into consideration the high class food service on the Malolo. A la carte meals, special dinners, and banquets are in order and, of course, this class of cooking is more expensive than table d'hôte.

The equipment stood up without breakdown during the entire voyage. This fact caused considerable comment as marine requirements are very severe, and any equipment which gives 100 per cent service without breakdown is particularly in demand. Another rather remarkable fact which was noted was that during the usual high temperature encountered in the Tropical Zone, the galley was at all times fairly comfortable. Those who have anything to do with the operation of a ship's galley know what serious complaint is had at sea.

We are all going to follow with interest these rather gigantic endorsements of electric application to large craft galleys. The marine world is not quick to completely revolutionize past practice, and rightly believes in the advancement of engineering on the basis of performance and proved merits. The precedent of many fine installations of electric galley equipment on the high seas in the past have brought about the splendid endorsements of these past few months on the largest vessels of their kind ever built.



Chief Baker Charles Joughin of the steamship California demonstrating his Edison electric bake ovens. "Wonderful equipment," says Charlie.

First Ocean Going Economizer



Fig. 1. Success of a Experiment of the Luckenbach steamer. (The first draft going steamer to be fitted with induced draught and high pressure fuel water economizer.)

In keeping with the demand for more efficient ships, there are many difficulties and about to overcome the possibilities of such fuel delivery, as particularly true has been found for electric generating stations, that have already been tried on ships. The same has been found in the case of steam generating stations, and the same is true of the case of the first ocean going steamer to be fitted with induced draught and high pressure fuel water economizer. The first ocean going steamer to be fitted with induced draught and high pressure fuel water economizer is the E. J. Luckenbach.

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The gases from all four boilers are carried to the economizer and through it in individual passages. The gases from the two starboard boilers are passed to an induced draft fan on one side and the gases from the two port boilers pass through a similar branch of the Y-shaped up-take to another induced draft fan. The division plate, or baffle, separating the flows of gases from the two boilers on each side is riveted plate construction until it reaches the in-take of the fan. At that point the division plate, or baffle, is hinged as shown in the accompanying illustration, Fig. 4. This is for the purpose of controlling the amount of gas drawn through each boiler. Moving the hinged baffle gives it the effect of a damper and provides



Fig. 2. Plan drawing showing the layout of the E. J. Luckenbach's boiler room as applied to the E. J. Luckenbach. The exact relation of units and small space required for the heating surfaces are well shown.

positive control of the draft condition in each boiler.

Fig. 2 shows longitudinal and cross section elevations through the boiler room. The paths of the gases from the boilers to the fans are clearly indicated. The fans are driven by individual steam engines with flexible drive and have proved very satisfactory in service.

Fig. 3 is an end view of the economizer with cover plates removed. This shows the insulation carefully packed around the return headers of the economizer, the hand hole plugs opposite the end of each economizer tube, and the soot blowing equipment which keeps the heat absorbing surfaces clean and operating at high efficiency.

The economizer was designed to increase the temperature of the feed water by 90 degrees and reports show that this has been exceeded in practice, the feed water at times having been increased in temperature by more than 100 degrees. The temperature of the stack gases has been reduced more than 250 degrees, which represents a material saving in fuel. All things being equal, this would indicate an economy of approximately 10 per cent.

From the point of view of operating engineers, there are two outstanding advantages of equipment of this kind:

First, it is simple, operates at re-



Fig. 3. A view of the economizer installation taken by a staff photographer of Pacific Marine Review in San Francisco harbor. This shows arrangement of soot blowers and accessibility of hand hole plugs for inspection or internal cleaning, if that should be necessary.

latively low gas temperatures, requires little attention, and virtually no repairs.

Second, it is capable of absorbing heat and saving fuel without a lot of attendant complication and has the ability to do so month after month without imposing demands upon the time of the engine crew except when it can conveniently be given.

After a trip through the engine

and boiler rooms of the F. J. Luckenbach, a Pacific Marine Review representative concluded that there was no doubt that the new unit will be well and intelligently handled, for it is a notable fact that when the several auxiliaries and adjuncts to a large boiler plant are kept clean and in fine order everything is given a chance to show its best work.

Briefly, the apparatus consists of a nest of tubes, the feed water entering near the top and passing counter current downward, so that the hottest gases come in contact with the hottest feed water as it leaves the economizer. The tubes are of the well-known armored type, having cast iron gilled rings shrunk on to the steel tube. This construction permits installation of a tremendous amount of heating surface within a limited space. The casings are absolutely gas-tight. Steam soot blowers are a part of the equipment, insuring clean surfaces at all times. Each economizer in reality forms a preboiler, as it becomes a part of the boiler and, being counter current, makes a more efficient heating surface than any other part of the boiler. Naturally, it follows that any steam vessel under-boilered may readily add "preboiler" economizer surface and thus overcome its difficulties with added efficiency thrown in.

These economizers can be installed as an adjunct to any type of boiler, effecting savings thereon.

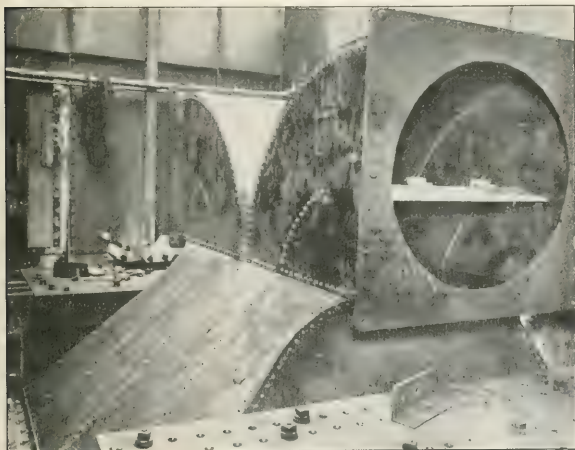


Fig. 4. Y-branch up-take casing before installation of fans was made. This shows the lines of gas passage from the boilers and adjustable damper at the end of the up-take division plate. As will be seen from this picture, no additional space was required for the economizer installation.

Quigley Bitumen Gun

IT is well known that the mop-and-pail method of applying hot tar, asphalt, pitches, enamels, heavy fluids, waxes, paraffines, and similar materials as a protective coating has always been slow, expensive, and unsatisfactory. The work has required a large number of men to carry the heated material from the melting pot to the job, by the slow and dangerous pail method, where it has been smeared on with mops or brushes, or poured. Complete and uniform coverage is impossible; application, penetration, and coverage depending on the rapidity and skill of the operator and temperature of the material.

The Quigley gun sprays or shoots liquids of practically any consistency or temperature through special insulated, metallic hose any distance up to several hundred feet from the gun. Volume and pressure are under easy control, assuring uniform coverage, regardless of atmospheric temperature.

The economies effected by the Quigley gun are remarkable. On a big penstock job, two men covered more surface than twelve could cover in the same time using the mop and sprinkling can method. And the work was done better. The spray penetrated every crack and crevice, reaching places difficult, if not impossible, to reach otherwise. The gun covered more than 60 square feet in 20 seconds. Five gallons were sprayed in one minute, covering approximately 125 square feet. Penetration and adhesion also depend largely on the speed and heat of the spray. As both are under constant control, practically perfect coverage is assured, and overheating to make up for delays in reaching the job at the proper temperature is not necessary.

So great are the savings made by this gun that it will frequently pay for itself on a single job. Ability to control the temperature and thickness of coating makes compliance with the most exacting specifications easy and permits close estimating of material and time.

Compressed air is never in contact with the material in the gun, nor is it used to form the spray. Atomization is obtained by a purely mechanical process. Air is not entrapped in the material, which retains all its original and valuable

properties, required for penetration and adhesion to the surface. Fifteen cubic feet of air a minute at 60 pounds pressure is sufficient to operate the gun. A small portable garage compressor, operated by either gasoline or electricity, will answer where no air supply is available.

The Quigley bitumen gun is an adaptation of the patented Quigley refractory gun, which has been highly successful in other fields, hundreds being in use for shooting plastic refractories or concrete

mixtures and in building or repairing furnace walls, baffles, concrete structures, stuccoing, plastering, etc. The gun consists of a cast iron cylinder from which the material is forced by a piston capable of high pressure. It is enclosed in a steel housing, mounted on wheels. Its capacity is 15 gallons, enough to cover approximately 400 square feet of surface.

Two unskilled men can operate the gun after a few minutes instruction—one man at the nozzle, the other charging the gun and controlling the air supply.

Large Wheel Truck for Oxy-Acetylene Equipment

AFTER thorough tests in field and shop, a new type of two-wheel truck has been put on the market by the Oxweld Acetylene Company, 30 East 42nd Street, New York. Increase in wheel size was a primary consideration in the design, larger wheels making the truck much easier to handle.

The illustration shows the new truck equipped with 24-inch steel wheels, having 3 by 3/8-inch grooved tires and a case iron hub. The hub is bored to fit the cold-rolled steel axle, and a grease cup is provided. Lubrication is of particular importance in overland pipe line work where the truck may be hauled long distances at fairly high speed behind a motor truck. The handle is continuous and the upper portion is bent back about 8

inches so that the truck can be easily handled by an operator of small stature. The tool box is larger and is provided with a cover and a holder for extra blowpipe tips.

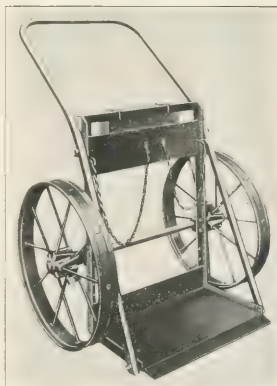
Where 24-inch wheels are not required, 14-inch wheels may be used instead merely by changing the position of the axle to the lower set of holes which are already drilled in the frame. The same frame and axle can be used with either size wheels. No grease cups are necessary with the smaller wheels.

Trade Literature

Service to steam and electric marine apparatus is the subject of the booklet **Standing By in Every Port**, recently published by the Westinghouse Electric and Manufacturing Company. This publication consists of a brief discussion of Westinghouse facilities for installation, repair, and engineering assistance for marine apparatus, and gives some fine examples of the company's service in the past. A complete list and map of Westinghouse service offices in various ports of the United States is also contained. Copies of this booklet may be obtained by writing to any Westinghouse office or to the Advertising Department at East Pittsburgh, Pennsylvania.

Trade Note

The United Fruit Company, which has established a large banana shipping terminal at San Francisco, may open a terminal at Los Angeles harbor to serve the southern part of the state and Arizona.



New large wheel truck for oxy-acetylene equipment.

Marine Insurance

Edited by JAMES A. QUINBY

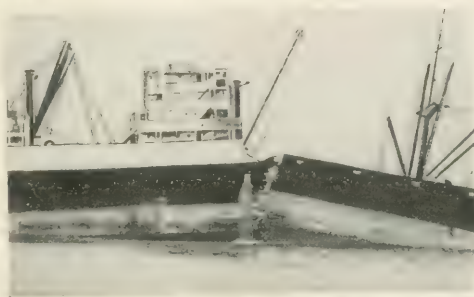
The Adjustment Committee

MARINE Underwriters around these parts are always touchy about something. One time it's the so-called "fish-boat pool" and another time it may be adjusters' agreements in general average cases. Just now it's the Adjustment Committee.

The Board of Marine Underwriters of San Francisco, in addition to its valuable service in connection with survey facilities and casualty information, includes in its equipment a committee of five members whose duty it is to make recommendations as to adjustments which are submitted to them in rough form. All general averages, and all hull claims over a certain amount, which are subjects of adjustment must be submitted to this committee. If approved, they are usually paid without demur, at least by local insurers. If disapproved, they are usually changed by the adjuster to meet the wishes of the committee, or a compromise is effected.

This committee has no mandatory powers. Its approval or disapproval has no weight in a court of law. It is significant, however, that cases are extremely rare where adjustments approved by the committee have been successfully contested in court.

Of course, the committee has made mistakes. So have you and I and the rest of us. When you consider that a corps of clever and hard-working adjusters spend from six months to two years preparing a cumbersome and devious adjustment, while the committee, none of whom is a technically skilled average adjuster, is able to check the work only by relatively brief examination, the wonder is that more mistakes have not been made. On the other hand, a great percentage of adjustments are fairly executed, and such errors or inaccuracies as may be discovered in them are largely based on sets of fact which give rise to difference of opinion among experts. An average adjuster is not, like Caesar's wife, above suspicion. In fact, he lives in a constant circumambient aura of distrust, and his approach causes the more timid underwriters to bar the shop



The Liverpool & Glasgow Salvage Association concluded a noteworthy feat when they salvaged the after end of the British Motorship "Lochmonar," shown above just after she broke her back on revetment near the mouth of the Mersey, Liverpool. The after part of the ship was cut away and its open end closed up by a cofferdam. The amputated portion was then towed safely into Liverpool with cargo aboard. This is one case where the stern of the ship reached port ahead of the bow.

windows and bury the family jewels under the rosebush. Being a reformed average adjuster, the writer wishes, in passing, to contribute his two cents worth toward correcting this impression.

Taking him by and large, the average adjuster is a pretty square shooter, if for no other reason than that of necessity. If he gets a reputation for hiding prize packages down among his G. A. allowances or juggling his apportionments, he builds up a constantly increasing fund of high-class trouble for himself and his clients. Consequently, the balance of necessity, and the innate honesty of the majority of mankind would probably prevent a world catastrophe even were there no Adjustment Committee in existence.

All of which is merely leading up to the conclusion that the Committee, with all its possible faults, is a successful piece of apparatus for working with adjusters rather than against them.

Would a Single Expert Be Preferable?

The Committee, as noted above, is composed of underwriters, not adjusters. As a result of this fact, certain technical objections which might be made to adjustments by adjusters or by lawyers are never made, which is a mighty good thing. If we were all lawyers or adjusters, the wheels of progress would rust in their bearings and the entire civilized world would be covered to a depth of four and one-half feet with applesauce. It is also true that certain untenable objections are sometimes made by members of the Committee, which might not be made by experts. Furthermore, it has been whispered in some quarters that certain members of the group are sometimes swayed by consideration of their own or their friends' welfare. These minor objections have been directed against every representative body since the city fathers of Athens first voted to tax the other fellows' property higher than their own. But it is significant to note that representative government is still doing business at the same old stand, while the successful Mussolinis of the world are

Arthur M. Brown

EDWARD BROWN & SONS

Arthur M. Brown, Jr.

MARINE DEPARTMENT—Harry W. Browne, Manager

PACIFIC COAST GENERAL AGENTS

THE GLOBE & RUTGERS FIRE INSURANCE CO., INC.

200 BUSH STREET, SAN FRANCISCO

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

09 COLMAN BUILDING, SEATTLE, WASHINGTON

ent, the latter including James French, chief surveyor for Lloyds, for the United States and Canada, who acknowledged the introduction by the new president, George Ismon, with a few well-chosen remarks. Mr. Ismon also announced that Harry Stoddard of the Automobile's Los Angeles office, had been elected an honorary member of the Association, and our friend Harry stood up on his hind legs and with true Los Angeles fervor extended the right hand to all and sundry.

At the business meeting held in the morning of the 28th, officers for the coming year were elected as follows: President, George H. Ismon of the Norwich Union Fire Insurance Society; Vice-President, Thomas K. Hannum of the Insurance Company of North America; Secretary, Walter L. Dawes of the Home Insurance Company of New York.

The entertainment was all that could be desired. Professor Schnitzel of radio fame, made the hit of the evening with his discussion of everything from insurance to football. After the third course (or was it the fourth—I forget) a newspaper was circulated among the members containing a serious expose of the real facts of their past life. Anyone who doubts the seriousness of this publication, and wishes to examine it for himself may obtain a copy free of charge by applying to the writer.

Mixed Cargo

We are in receipt of the Institute of London Underwriters' Annual Report of the year 1927 and wish to acknowledge the courtesy of the Institute in placing us on their mailing list. For those who are interested in the personnel of the British organization, we note that H. M. Merriman, underwriter of the Eagle Star & British Dominions Insurance Co., Ltd., and G. A. T. Darby, manager of the Marine Insurance Company, Ltd., were unanimously elected chairman and deputy-chairman respectively for the coming year.

Imogene, our pet stenographer, wonders whether Mr. Darby's friends call him "Gat."

Mr. Merriman, in his remarks delivered on the occasion of the 44th annual general meeting of the Institute, January 27, 1928, gives a brief outline of the work of the organization in standardizing clauses and dealing with various technical difficulties that arise in the marine field. Judging from his comment the London underwriter is not particularly pleased with the condition of the cargo market.

"In my opinion," says the Chairman, "Cargo underwriting is not conducted, in very many instances, on sound lines. It seems to have become

the custom just because an account shows a 15 per cent or a 20 per cent profit for an Underwriter to be willing to continue the business, or possibly take it away from a colleague, without going into the question of the character of the claims. If he did so I am sure in many cases he would find the F.P.A. portion of the rate had been cut into by the claims not due to a casualty, and business continued on such lines as these must result in a loss in the end.

For example, take cargo at 5/- F.P.A. with 2/6% additional for Average and other trimmings, and the claims work cut at 5/-, there is obviously a profit on the account of 33-1/3%, but this is only possible by reducing the basic F.P.A. rate to 2/6%, which would be absurd. There is no doubt this section of our business could be improved in many ways by eradicating from the policy some of the risks that in pre-war years were never covered in a Marine Policy. For instance, Underwriters frequently very foolishly cover the trade loss risk which is manifestly a most dangerous thing to do. I feel confident if Underwriters were firm in refusing to cover such risks the various trades would soon adjust the conditions of sale.

"Also in so many insurances today the Underwriters have made themselves responsible for the risks that should be rightly borne by the carrier and/or shipowner. If those who have the custody of the goods whilst in transit have the responsibility removed from their shoulders it must in many cases tend to carelessness. If these risks were not covered by the policy I feel confident there would be greater supervision on the part of those concerned for the protection of goods during transit."

This business of cutting a ship in two seems to be quite common. At the head of the column, we reproduced a picture of the Lochmonar, half of which was broken off and nonchalantly towed to port after a serious accident.

C. W. Brown, manager of Butterfield & Swire in Japan, had occasion to complete a similar job for the Tai-koo Dockyards in connection with the Java-Pacific freighter Tijlboet that went ashore and sank on Linting Island near Hong Kong last April. As the ship could not be floated as a whole, Brown proceeded to cofferdam the broken portion and cut the ship in two with acetylene torches. The ends were then sealed, the water blown out and the two parts floated and towed to

Balfour, Kessler Agencies Inc.

Marine Insurance Department

Agents for

AMERICAN AND FOREIGN
NORTH OCEAN

UNION OF COMPANIES
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the dockyard where they were joined together and the ship made as good as new—better in fact since the completed ship resulted in a vessel one plate longer than the old one.

At the January 16 meeting of the Study Class of the Marine Underwriters of San Francisco, Eric A. Falconer, assistant secretary of the Independence Indemnity Company, spoke on "The Relation of Casualty Insurance to the Marine Field." He commented on the various types of casualty, indemnity, and surety coverage, pointing out that bonding and credit insurance, like boiler explosion coverage, is really not insurance at all since the risk of loss is not the quid pro quo for the premium, but the premium is really paid as a fee for inspection or investigation service.

The second speaker of the evening was Carl I. Wheat, attorney for the State Railroad Commission, whose subject was "The History of the Regulation of Transportation in California." Mr. Wheat stressed the outstanding events in the history of the Railroad Commission and the situation which led up to its creation with particular reference to the state's jurisdiction in matters pertaining to truck lines and water transportation.

The meeting of June 30 was noteworthy for the absence of technical discussion but offered an abundance of geographic information. The first speaker was Colonel T. B. Esty, San Francisco representative of the Mississippi-Warrior Service, the government operated barge sys-

tem, originally named from the fact that it operated on the Mississippi River to St. Louis and on the Warrior and connecting rivers to Birmingham. The colonel pointed out that this service has now been extended to reach Minneapolis and Missouri River points direct, and to reach forty-three states by virtue of its rail connections. An interesting feature from the insurance man's viewpoint is found in the fact that the bill of lading now in use by the Mississippi-Warrior Service carries insurance coverage against practically all risks including the Act of God.

The second speaker of the evening was Captain L. L. Lane, adventurer extraordinary, who edified the class with a running description of Alaskan waters gained during his twenty odd years of experience in the north. The captain's comments on the hazards on the island-dotted coast, the seasonal dangers from ice, and the facilities for docking and repairing at the various northern ports were gratefully appreciated by the underwriting members of the class.

Captain Lane, who was skipper for the H. A. Snow expeditions, is to command the Madrono, a 175-foot steamer recently purchased from the Lighthouse Service, on a trip into northern waters under the auspices of Expeditions Inc. this summer. The voyage is to be a combined sightseeing and hunting trip and the hearty captain is recruiting a company of adventurers at so much per to sail on the first venture of the sort ever to head as far north as Wrangell Island.

ance of this gauge installations have been made on the U. S. S. Wright, U.S.S. Camden, and S-13, and a contract has just been awarded for a complete Liquidometer installation on the new Submarine V-4. Liquidometers also were recently installed on the steamships Westmount and West Helix.

The water works pumping equipment of the City of Haverhill, Massachusetts, is described in a 4-page leaflet issued by the **De Laval Steam Turbine Co.**, of Trenton, N. J. The city operates two pumping stations, one at Kenzoza and the other at Millvale, both of which were originally equipped with reciprocating pump units. With a view to increasing the water supply and reducing pumping costs, two electric motor-driven De Laval centrifugal pumps have been installed, one having a capacity of a little over 7,000,000 gallons per 24 hours against 90-foot head, and the other a capacity somewhat in excess of 6,000,000 gallons per day against 211-foot head. In the official acceptance tests, these units developed a very high overall efficiency from wire to water.

National Soot Blowers, made by the **National Flue Cleaner Company** of Groveville, New Jersey, are described in a bulletin just issued.

These blowers are designed only for use with horizontal return tubular and Scotch marine boilers. Unlike other types, they employ a separate nozzle, in a fixed position, for each boiler tube. This makes it impossible for any tube to escape the scouring action of the steam jet. The blower is located in the front of the boiler and is operated from the floor level, the tubes being cleaned in four sections, in turn. Where the up-take is in the back of the boiler, and the hot gases make a third pass over the top of the boiler shell, batteries of nozzles are also provided for cleaning the shell. These soot blowers can be operated with either steam or compressed air without interfering with the steaming of the boiler. Since a 1/5-inch coating of soot is equivalent as a heat insulator to a 1-inch layer of asbestos, a substantial economy in fuel invariably results from frequent soot blowing.

Trade Literature

Marine Liquidometer, distance reading tank gauge for use in gauging tanks containing fuel oil and other liquids on ships, is described and illustrated in a bulletin recently issued by the **Liquidometer Co.**, Long Island City.

Gauges heretofore offered for the purpose operate on the hydrostatic or air principle, which involves the use of pumps and valves and cannot be accurate or depend-

able on account of the inaccuracies inherent in that principle. All liquidometers operate on a patented balanced hydraulic principle, which provides a dependable and accurate gauge, and is as free from the inaccuracies of the hydrostatic principle as it is simple, reliable and durable. Over four years ago, the first marine liquidometer was installed on the United States Submarine S-22, and on the perform-

The vessels will be about 500 feet in length, twin screws, fitted with geared turbines, steam being supplied by Babcock & Wilcox water-tube boilers. Auxiliaries will be diesel-electric driven.

Shipping Board Appropriations in House Measure

In the Independent Offices Appropriations Bill passed by the House of Representatives on January 24, an appropriation of \$1,400,000 was added to the Shipping Board allotment for the reconditioning of the 30 cargo ships to be used as coal carriers. An additional \$12,000,000 had already been added to the appropriations for the reconditioning of the steamships Mt. Vernon and Monticello.

Plan for Fast Atlantic Liners

Plans of Lawrence R. Wilder and associates for the construction and development of a line of fast passenger ships for the transatlantic service were presented before the Shipping Board January 24. The matter was taken under advisement by the Board.

The proposal outlined the construction of six 900-foot vessels of 35,000 gross tons each, capable of maintaining an average sea speed of approximately 33 knots an hour. The line is to be known as the Blue Ribbon Line, and will maintain a thrice-weekly service from some American port on the North Atlantic to channel ports of Europe. The proposal contemplates a construction loan from the government to the extent of \$94,500,000, or approximately three-fourths of the construction cost of the vessels, interest to be paid at the same rate the government pays in borrowing and repayment of the loan to be made over a period of twenty years.

Others appearing with Mr. Wilder were Herbert C. Sadler, professor of Naval Architecture and Marine Engineering, University of Michigan; M. W. Torbet, chief engineer shipbuilding division, American Brown-Boveri Electric Corporation; J. Howland Gardner, vice-president, New England Steamship Co., New York; and Professor Simon Litman, Economics & Transportation, University of Illinois.

Bureau of Yards and Docks, Navy Department, Mare Island, will open bids soon for equipment and refrigerating plant at Mare Island Navy Yard.

Some Recent Shipbuilding Orders

Federal Shipbuilding & Drydock Co., Kearny, N.J., has an order from Ira Bushey & Sons, Brooklyn, for a 130 ft. steel barge. The barge is to be self-propelled, but installation of the machinery will be made by the owners.

Howard Shipyards & Dock Co., Jefferson, Ind., has an order from T. L. Herbert & Sons, Nashville, for a diesel tugboat to be 64 ft. 8 ins. between perpendiculars, 18 ft. beam, and 3 ft. 6 ins. depth; powered with 120 horsepower diesel engine.

Great Lakes Engineering Works, River Rouge, Mich., has an order from the City of Detroit for a derrick scow 70 by 31 by 50 ft. 6 ins.

Lake Washington Shipyards, Houghton, Wash., has an order from the Kitsap County Transportation Co., Seattle, for a diesel-powered ferryboat, 190 ft. long by 57 ft. beam, powered with 800 horsepower Washington-Estep engines.

This yard also has an order for a 72 ft. cannery tender for the New England Fish Co., Seattle, to be powered with Washington-Estep engine; a 42 ft. troller for Mr. Nelson of Seattle; and a 55 ft. scow for the Pioneer Packing Co., Seattle.

Dravo Contracting Co., Pittsburgh, has an order from the Hainesport Mining & Transportation Co. for a hopper type steel barge, 71 ft. 6 in. by 24 ft. by 8 ft. 9½ in. This yard is also building for stock seven steel barges.

American Bridge Co., Pittsburgh, has an order from the Tennessee Coal, Iron & Railroad Co. for a towboat hull, 140 by 25 by 5 ft.

Bath Iron Works, Bath, Maine, has an order from Edward B. Dane of Brookline, Mass., for a twin screw, steel yacht to be powered with diesel engines; 220 ft. 3 in. length, 36 ft. molded beam, 14 ft. 6 in. draft.

Collingwood Shipbuilding Company, Collingwood, Ontario, has an order for a pontoon lock gate lifter for the Dept. of Railways and Canals of Canada; also order for a motor scow for the Brown Corporation of Quebec.

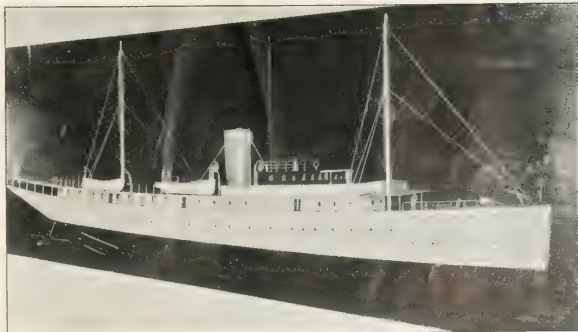
Federal Shipbuilding & Drydock Co., Kearny, N.J., has an order from the S. Bushey & Sons, Brooklyn, for a barge 130 by 28 by 11 feet. This is to be a self-propelled barge, the power plant to be installed by the owners.

The Spear Engineers, Inc., Portsmouth, Virginia, has an order from the Claiborne-Annapolis Ferry Co. for a 198-foot double-end diesel ferryboat to be powered with two 450-horsepower Fairbanks - Morse diesel engines.

The Charles Ward Engineering Works, Charleston, West Virginia, has an order from the Alpha Sand Co., St. Louis, for a twin screw tunnel towboat to be powered with two 180-horsepower Fairbanks - Morse diesel engines. This yard will also build a stern-wheel towboat for stock, duplicate of hull 65, to be powered with 100 horsepower Fairbanks-Morse diesel engine.

Davis Shipbuilding & Repairing Co., Lauzon, Quebec, has an order for a diesel powered tug for the Anticosti Paper Co., of Montreal.

George Lawley and Son Corporation, Neponset, Mass., has a contract from Eldridge-McEnnis, na-



Model of the yacht for Edward B. Dane now building at the Bath Iron Works.

stalled to date. Communication is instantaneous between all the craft equipped, and with the tug dispatching office ashore at Wilmington.

Boat Firm Plans for Expansion
The co-partnership of H. M. Angelman and T. S. Smith, known as the Wilmington Boat Works, Wilmington, California, has been incorporated into the Wilmington Boat Works, Inc., with capital stock of \$250,000, of which \$100,000 is to be utilized for adding to the plant equipment. A principal part of the expansion program will be a steel, 90-foot boom derrick with a lifting capacity of ten tons for handling all small boats up to that weight.

KEEL LAYINGS

Sea Sails III, wood yacht for Murray W. Sales Detroit, by Defoe Boat & Motor Works, Bay City, Mich., Jan. 12.

Oil barge for Oil Transfer Corp., New York, by Federal Shipbuilding & Drydock Co., Kearny N.J., Jan. 3.

Sand and gravel barge for Nugent Sand Co., Louisville, Ky., by Howard Shipyards & Dock Co., Jan. 26.

Wharf barge for Ohio River Sand Co., Louisville, Jan. 12.

W. J. Harahan, tugboat for Chesapeake & Ohio Railway Co., by Newport News Shipbuilding & Drydock Co., Jan. 20.

Motor tanker for Sun Oil Com-

pany by Sun Shipbuilding Company, Dec. 21.

LAUNCHINGS

Stern-wheel towboat for Magdalena River, Colombia, by Marietta Manufacturing Co., Jan. 23; 3 steel hopped cargo barges, Jan.

President Warfield, passenger and freight vessel for Baltimore Steam Packet Co., by The Pusey & Jones Corp., Feb. 6.

Mary Ellen O'Neill, tanker for California Petroleum Corp., by Sun Shipbuilding Co., Jan. 23.

Golden Age, diesel-electric ferryboat for Golden Gate Ferry Co. by General Engineering & Drydock Co., Jan. 14.

Midnight Sun, fishing troller for John Nelson, Seattle, by Lake Washington Shipyards, Houghton, Wash., Feb. 16.

Robert W. Stewart, tanker, for Standard Oil Co. (Ind.), by American Ship Building Co., Dec. 3.

DELIVERIES

Dixie, passenger and freight steamer for Southern Pacific Steamship Lines, New York, by Federal Shipbuilding & Drydock Co., Jan. 16.

California, passenger liner for Panama Pacific Line by Newport News Shipbuilding & Drydock Co., Jan. 13.

Savarona, steel twin-screw diesel yacht for Richard Calwalader, Jr., by the Pusey & Jones Corp., Jan. 20.

Hull 141, cannery tender for P. E. Harris & Co., Seattle: 76'x18' x8' 6".

Hull 142, scow for Libby, McNeill & Libby, Seattle: 72'x24'x5'6".

PRINCE RUPERT DRYDOCK & SHIPYARD.

Prince Rupert, B.C.

One halibut fishing boat for John Ivarsen, 58'x14'6"x6'4"; 60 H.P. Fairbanks-Morse semi-diesel eng.; keel Dec. 19/27; launch Feb. 22/28 est.; deliver Mar. 15/28 est.

One halibut fishing boat for Hans Underdahl, 58'x14'6"x6'4"; keel Dec. 19/27.

U. S. NAVY YARD.

Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

LAKE WASHINGTON SHIPYARDS.

Houghton, Wash.

Purchasing Agent: A. R. Van Sant. Not named, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P. 57' beam: 800 I.H.P. Washington-Estep diesel eng.

Cannery tender for New England Fish Co., Seattle. 72' length; Washington-Estep diesel eng.

Midnight Sun, troller for Capt. John Nelson, Seattle: 42' length; 11 ft. beam: 5 ft. draft; 40 H.P. diesel eng.; launched Feb. 16/28.

Scow for Pioneer Packing Co., Seattle; 55' length.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Ten covered barges for Carnegie Steel Co.: 175'x26'x11'.

One towboat for Tennessee Coal, Iron, & R. R. Co.: 140'x25'x7'.

AMERICAN BROWN-BOVERI

ELECTRIC CORP.,

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; deliver June 13/30 est.

THE AMERICAN SHIP BUILDING COMPANY,

Cleveland, Ohio.

Purchasing Agent: C. H. Hirschinger.

Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana): 373 L.B.P.; 52 beam: 20 loaded draft; 12 mi. loaded speed: 6200 D.W.T.: 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'x4 1/2'x11'6"x180 lbs. pressure; keel Aug. 29/27.

Not named, hull 803 motor tanker for F. C. Wright; 334 feet L.B.P. 51 feet beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,

Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25.

No. 45, electric cutter for U. S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of February 1, 1928

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson. Steel dredge hull, for U. S. Smelting, Refining & Mining Co., Oakland, Calif.; 168x60'x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above; 100x50'x11'4"; 6 cu. ft. buckets; deliver Apr. 1/28 est.

Waialeale, hull 5355, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4 1/2" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12-268 sq. ft. heating surface; keel Nov. 15/27; launch Mar. 15/28 est.

GENERAL ENGINEERING & DRYDOCK CO.,

Alameda, California

Purchasing Agent: Al. Wanner.

Golden Age, hull 12, diesel-electric wooden auto ferry for Golden Gate Ferry Co.: 240 L.O.A.; 44 beam; 10'6" loaded draft; 3 400 H.P. Ingersoll-Rand diesel engs.; Westinghouse 950 S.H.P. motors; keel Oct. 27/27; launched Jan. 14/28.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wn.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x36'x11 ft.; launched Oct. 5/27.

Crane, hull 125, patrol boat for U.S. Bureau of Fisheries, Seattle; 90 L.B.P.; 20 beam; 13'5" loaded draft; 200 H.P. Washington-Estep diesel engs.

Northern Light, hull 134, twin screw cannery tender; for Northern Light Packing Co., Cordova, Alaska; 55 L.B.P., 13 beam.

Hull 135, fish scow for Alitak Packing Co., Seattle; 55 by 18 by 4 ft.

Hull 136, same as above.

Hull 137, fish scow for P. E. Harris & Co., Seattle; 60' long by 16' beam.

Hull 138, same as above.

Hull 139, pot scow for P. E. Harris & Co.; 28'x10'x2'10".

Hull 140, same as above.

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 1963-64, 1965-66, 1966-67, 1967-68, 1968-69, 1969-70, 1970-71, 1971-72, 1972-73, 1973-74, 1974-75, 1975-76, 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86, 1986-87, 1987-88, 1988-89, 1989-90, 1990-91, 1991-92, 1992-93, 1993-94, 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24, 2024-25, 2025-26, 2026-27, 2027-28, 2028-29, 2029-30, 2030-31, 2031-32, 2032-33, 2033-34, 2034-35, 2035-36, 2036-37, 2037-38, 2038-39, 2039-40, 2040-41, 2041-42, 2042-43, 2043-44, 2044-45, 2045-46, 2046-47, 2047-48, 2048-49, 2049-50, 2050-51, 2051-52, 2052-53, 2053-54, 2054-55, 2055-56, 2056-57, 2057-58, 2058-59, 2059-60, 2060-61, 2061-62, 2062-63, 2063-64, 2064-65, 2065-66, 2066-67, 2067-68, 2068-69, 2069-70, 2070-71, 2071-72, 2072-73, 2073-74, 2074-75, 2075-76, 2076-77, 2077-78, 2078-79, 2079-80, 2080-81, 2081-82, 2082-83, 2083-84, 2084-85, 2085-86, 2086-87, 2087-88, 2088-89, 2089-90, 2090-91, 2091-92, 2092-93, 2093-94, 2094-95, 2095-96, 2096-97, 2097-98, 2098-99, 2099-00, 2100-01, 2101-02, 2102-03, 2103-04, 2104-05, 2105-06, 2106-07, 2107-08, 2108-09, 2109-10, 2110-11, 2111-12, 2112-13, 2113-14, 2114-15, 2115-16, 2116-17, 2117-18, 2118-19, 2119-20, 2120-21, 2121-22, 2122-23, 2123-24, 2124-25, 2125-26, 2126-27, 2127-28, 2128-29, 2129-30, 2130-31, 2131-32, 2132-33, 2133-34, 2134-35, 2135-36, 2136-37, 2137-38, 2138-39, 2139-40, 2140-41, 2141-42, 2142-43, 2143-44, 2144-45, 2145-46, 2146-47, 2147-48, 2148-49, 2149-50, 2150-51, 2151-52, 2152-53, 2153-54, 2154-55, 2155-56, 2156-57, 2157-58, 2158-59, 2159-60, 2160-61, 2161-62, 2162-63, 2163-64, 2164-65, 2165-66, 2166-67, 2167-68, 2168-69, 2169-70, 2170-71, 2171-72, 2172-73, 2173-74, 2174-75, 2175-76, 2176-77, 2177-78, 2178-79, 2179-80, 2180-81, 2181-82, 2182-83, 2183-84, 2184-85, 2185-86, 2186-87, 2187-88, 2188-89, 2189-90, 2190-91, 2191-92, 2192-93, 2193-94, 2194-95, 2195-96, 2196-97, 2197-98, 2198-99, 2199-00, 2200-01, 2201-02, 2202-03, 2203-04, 2204-05, 2205-06, 2206-07, 2207-08, 2208-09, 2209-10, 2210-11, 2211-12, 2212-13, 2213-14, 2214-15, 2215-16, 2216-17, 2217-18, 2218-19, 2219-20, 2220-21, 2221-22, 2222-23, 2223-24, 2224-25, 2225-26, 2226-27, 2227-28, 2228-29, 2229-30, 2230-31, 2231-32, 2232-33, 2233-34, 2234-35, 2235-36, 2236-37, 2237-38, 2238-39, 2239-40, 2240-41, 2241-42, 2242-43, 2243-44, 2244-45, 2245-46, 2246-47, 2247-48, 2248-49, 2249-50, 2250-51, 2251-52, 2252-53, 2253-54, 2254-55, 2255-56, 2256-57, 2257-58, 2258-59, 2259-60, 2260-61, 2261-62, 2262-63, 2263-64, 2264-65, 2265-66, 2266-67, 2267-68, 2268-69, 2269-70, 2270-71, 2271-72, 2272-73, 2273-74, 2274-75, 2275-76, 2276-77, 2277-78, 2278-79, 2279-80, 2280-81, 2281-82, 2282-83, 2283-84, 2284-85, 2285-86, 2286-87, 2287-88, 2288-89, 2289-90, 2290-91, 2291-92, 2292-93, 2293-94, 2294-95, 2295-96, 2296-97, 2297-98, 2298-99, 2299-00, 2300-01, 2301-02, 2302-03, 2303-04, 2304-05, 2305-06, 2306-07, 2307-08, 2308-09, 2309-10, 2310-11, 2311-12, 2312-13, 2313-14, 2314-15, 2315-16, 2316-17, 2317-18, 2318-19, 2319-20, 2320-21, 2321-22, 2322-23, 2323-24, 2324-25, 2325-26, 2326-27, 2327-28, 2328-29, 2329-30, 2330-31, 2331-32, 2332-33, 2333-34, 2334-35, 2335-36, 2336-37, 2337-38, 2338-39, 2339-40, 2340-41, 2341-42, 2342-43, 2343-44, 2344-45, 2345-46, 2346-47, 2347-48, 2348-49, 2349-50, 2350-51, 2351-52, 2352-53, 2353-54, 2354-55, 2355-56, 2356-57, 2357-58, 2358-59, 2359-60, 2360-61, 2361-62, 2362-63, 2363-64, 2364-65, 2365-66, 2366-67, 2367-68, 2368-69, 2369-70, 2370-71, 2371-72, 2372-73, 2373-74, 2374-75, 2375-76, 2376-77, 2377-78, 2378-79, 2379-80, 2380-81, 2381-82, 2382-83, 2383-84, 2384-85, 2385-86, 2386-87, 2387-88, 2388-89, 2389-90, 2390-91, 2391-92, 2392-93, 2393-94, 2394-95, 2395-96, 2396-97, 2397-98, 2398-99, 2399-00, 2400-01, 2401-02, 2402-03, 2403-04, 2404-05, 2405-06, 2406-07, 2407-08, 2408-09, 2409-10, 2410-11, 2411-12, 2412-13, 2413-14, 2414-15, 2415-16, 2416-17, 24

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1959, p. 104, fig. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 8

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Dec 1906

Went to the lake at 10 A.M. and found the water very cold. The ice was about 1/2 inch thick. The wind was from the north and the sky was overcast. The temperature was about 30 degrees below zero.

Keel Dec 29/27

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launch Mar. 1/28 est.; deliver Apr./28 est.
Not named, hull 261, auto ferry for State of Michigan; 190' L.B.P.; 48 beam; 12 loaded draft; 11 knots speed; T.E. engs. 1000 I.H.P.; 2 Scotch boilers; 11' 10" diam.; keel Feb. 15/28 est.

Hull 262, flat scow for Great Lakes Dredge & Dock Co.; 130'x32'x10' depth; keel Feb. 25/28 est.; launch Apr. 1/28 est.; deliver Apr. 20/28 est.

Hull 263, derrick scow for above; 120'x42'6"x10'; keel Mar. 1/28 est.; launch Apr. 15/28 est.; deliver May 5/28 est.
Hull 264, derrick scow same as above; keel Mar. 10/28 est.; launch Apr. 25/28 est.; deliver May 20/28 est.

Hull 265, derrick scow for City of Detroit 70'x31'x5'6".

HOWARD SHIPYARDS & DOCK COMPANY, Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

J. J. Hennen, hull 1637, diesel tug for J. J. Hennen & Bro., Hawesville, Ky.; 76' L.B.P.; 18 beam; 6 depth; 10 mi. speed; 220 I.H.P. diesel engs.; keel Dec. 8/27; launch Feb. 15/28 est.; deliver Mar. 20/28 est.

Hull 1638, sand and gravel barge for Nugent Sand Co., Louisville, Ky.; 110' 10" x28' 7" x3' depth; keel Jan. 26/28.

Hull 1639, sand and gravel barge same as above; keel Feb. 7/28 est.

Hull 1640, wharf barge for Ohio River Sand Co., Louisville, Ky.; 132'x30'x4' 4" keel Jan. 12/28.

Hull 1641, towboat hull for Island Creek Coal Co., Cincinnati; 135' 6"x26' 6"x5'.

Sally H. hull 1642, diesel towboat for T. L. Herbert & Sons, Nashville, Tenn.; 84' 8" L.B.P.; 18' beam; 3'6" depth; 120 I.H.P. diesel eng.

MANITOWOC SHIPBUILDING CORPORATION Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hulls 235 and 236, two dump scows for Great Lakes Dredge & Dock Co., Chicago; 223'x42'4"x15'; keel Dec. 1/27.

Hulls 237 and 238, two barges for U.S. Engineers, Milwaukee; 80 x 26 x5 ft.; Ellis Channel steel hull construction.

Hull 239, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 100'x37'x7'6".

Hull 240, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 120'x30'x7".

Hull 241, diesel tug for Great Lakes Dredge & Dock Co.; 114'6" L.B.P.; 27' beam.

Hull 242, steam tug for Fitzsimmons Connell Dredge & Dock Co.; 75'x16'.

Hull 243, 800-yd. dump scow, for Fitzsimmons Connell Dredge & Dock Co.; 136'x37'.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Stern-wheel towboat for Magdalena River, Colombia; 168x42x5 ft.; keel Aug. 4/27; launched Nov. 5/27; deliver Jan. 20/28 est.
Stern wheel tugboat for Magdalena River, Colombia; 173x44x5ft. 6in.; keel Sept. 1/27; launched Jan. 23/28.

Stern wheel towboat for Magdalena River, Colombia; 168x42x5ft.; keel Nov.

8/27; launch Mar. 1/28 est.

Twenty steel hopped cargo barges for Magdalena River, Colombia; 125x26x6 ft.; launch 3 Jan. 20/28.

MIDLAND BARGE COMPANY

Midland, Pa.

Not named, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x5ft. 6in.; steam tandem comp. eng. 14"x28"x7'6" stroke; keel March 1/28 est.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Four steel sand barges for E. T. Slider, New Albany, Ind.; 120'x30'x7'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6".

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 136 deck barge for Bedford Nugent Co.; 110'x28'x7'3".

Hull 137, same as above.

Hull 138, deck barge for Granville Stone & Gravel Co.; 130'x32'x8'.

Hull 139, same as above.

Hull 140, same as above.

Hull 141, deck barge for Big Rock Stone & Mat. Co.; 100'x26'x6'6".

Hull 142, tug for stock; 44'x9'6"x4'3"; 80 H.P. Worthington diesel.

Hull 143, deck barge for International Cement Co.; 180'x40'x9'6".

Hull 144, same as above.

Hull 145, same as above.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

California, hull 115, 18-knot, passenger liner for Panama Pacific Line, New York; 600 ft. long, 80 ft. beam, 52 ft. depth; water tube boilers for oil burning, 22,000 gro. tons; 17,000 I.H.P.; keel Mar. 20/26; launched Oct. 1/27; delivered Jan. 13/28.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel Apr. /28 est.; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launch Mar. /28 est.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27.

W. J. Harahan, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14'6" depth; one screw; T.E. eng.; Scotch boiler; coal burning; keel Jan. 16/28.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

Savarona, hull 1034, steel twin-screw diesel yacht for Richard Cadwalader, Jr., Philadelphia; Henry J. Gielow, Inc., naval architect, New York; 294' L.O.A.; 38'3" beam; 16' loaded draft; 2 Bessemer diesel

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Trade, Traffic, and Shipping

Teach More Spanish

By O. K. Davis, Secretary,
The National Foreign Trade Council.

IF business men are united on one suggestion for improving the language instruction in American schools with a view to bringing it more in line with the practical needs of the near future, it is to teach more Spanish. There is no language which has more rapidly increased in practical use among Americans in the last ten years engaged in all phases of our international commerce, accompanied by greater intimacy and closer understanding with the Latin American peoples who, for their part, have turned to the United States as never before to appreciate and embrace the American standard of living.

Similarly, we understand and respect the Latin-Americans, for our part, more than ever before. And we find ourselves committed to selling them one-third of all the manufactured goods exported from this country, a year by year process of intricate mutual dealing in which thousands of young Americans are going to be called on to carry on the connection. No element in our future growth offers more unlimited possibilities than this new understanding between the Americas, and no American with imagination doubts that the future development of Latin America during the twentieth century will rival the growth of our own nation during the nineteenth.

Our Trade Progress Southward

The boldly outstanding fact in American trade development during the last fifteen years is the astonishing progress made by our producers and traders in the art and science of exporting to Latin America and all of whose twenty republics save two speak the Spanish language.

The United States is now the first supplier of goods to every republic in Latin America except Paraguay, and there is only one per cent difference between the British trade with Paraguay and ours. The great preponderance of our exports southward is made up of finished manufactures. Practically one-fifth of our entire export trade finds its market in the countries between the Rio Grande and Cape Horn. Our

imports from Latin America are habitually greater in value by about a hundred million dollars than our exports to those countries. The total of our foreign trade with them is approximately two billion dollars a year.

This represents an astounding development in the last ten or fifteen years. Our exports to Latin America have more than trebled in value since 1913. In that year our sales to the markets south of the Rio Grande aggregated only about \$300,000,000. Last year they were well over \$900,000,000. In 1910 we furnished 14 per cent of South America's imports against 86 per cent by the rest of the world. Last year our share was 28 per cent and the rest of the world had dropped to 72 per cent.

In Central America and the West Indies combined our share of their import trade grew in the same period from 25 per cent to 37½ per cent. In Central America alone it increased from 40 per cent to 66 per cent. No other country in the world has made such a record.

Throughout the whole of Latin America we are selling more of our products today than are our three principal competitors — England, Germany, and France — put together. Our priority of interest is firmly established, and it is time that this should be recognized at home, together with the responsibilities it entails.

Why Americans Have Made Good In Latin America

When we come to an investigation of the reasons for this remarkable development in our valuable trade with these Spanish speaking countries, we find, at once, and every open-minded investigator so reports, that we have greatly improved our understanding of the markets. More and more Americans have learned and are learning the Spanish language, really learning it getting acquainted with its intricacies and possibilities as well as its beauties. There are thousands of Americans today who are far beyond the "Si Señor" and "muchas gracias" stage. They can tell the difference between sewing and cooking by sight

and sound, and have no more need of an interpreter in a government office or counting house, or, for that matter, in a drawing room than in a restaurant. It counts, has counted, and will continue to count.

Along with the improvement in the ability to use the Spanish language there has come vastly better understanding of Latin American psychology and culture. This has been accompanied by a corresponding change in the character and qualifications of American commercial representatives for Latin American countries. Simp has been replaced by Simpatico. Brass tactics have given place to tact. I would not undertake to say whether it is this better understanding that has produced all the better trade or whether improving trade has also improved understanding and relations. Surely it is not so very far fetched to infer that better and more widespread knowledge of the Spanish language has had its effect in both directions.

There are, of course, other factors which have contributed strong influence to the improvement of trade and of commercial relations with Latin America. To begin at the foundation, transportation and communication, the two great fundamentals of civilization have been vastly improved. Steamship service is faster and more frequent, with travelling accommodations as fine as can be found on any ocean. One natural result of this has been an increase of travel both ways. More Americans have visited Latin American countries and more Latin Americans have come to the United States. The addition of 10,000 miles to the American Cable system has given us an all-American service all round South America, a factor that is not to be overlooked when considering the causes of trade expansion.

Increasing knowledge of Latin American countries and peoples has brought inevitably more opportunities for favorable investment of American capital. Such investment has grown with great rapidity, especially in the last few years until now we have a total of some five

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NEW YORK	May	May	May
San Francisco	May	May	May
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New York City

billions of American dollars at work south of the Rio Grande, most of them energetically stimulating the production of the countries where they are domiciled. And this also counts, both for better trade and for better relations.

Our Foreign Traders Look to Pan-America

It is also worth more than passing comment that when the Fifteenth National Foreign Trade Convention meets in Houston on April 25, 26, and 27 next, Latin American visitors will be present from all the larger countries south of us, and 1500 of the leading American foreign trade executives will turn

their minds to friendly cooperation with these nations as the most important field of business statesmanship now available for the United States.

It would surely seem to any open-minded person, in conclusion, that the language of a great continent—and that portion of the world with which our practical relations are more rapidly increasing than with any other—is not merely important but vital to our schools, and that the appeal for more Spanish in our schools should receive a conclusive and wholly sufficient answer in terms of a curriculum expanded to meet modern needs.

A Unique Sample

A NEW kind of sample for a new kind of traveling man formed an important part of the cargo of the steamship West Cactus of the McCormick Pacific-Argentine-Brazil Line when she sailed from San Francisco February 16th for Rio de Janeiro.

This sample is a Seattle-built Boeing pursuit plane, and the traveling man is Captain Ralph O'Neill, who served overseas with the American Expeditionary Forces, earning the distinction of an Ace. Captain O'Neill will arrive in Rio several weeks in advance of the plane, having gone via New York, where he takes a fast passenger liner for the last leg of his journey.

The plane will be used by O'Neill in making short, fast flights, and is equipped for catapulting from the deck of a steamer and for making deck landings. This is considered the last word in pursuit plane for either naval or land purposes, having a speed of about 165 miles per hour.

In March, the McCormick freighter West Nilus will carry a Boeing flying boat, equipped with a Pratt & Whitney "Wasp" engine, which is to be used along the Coast, up the Amazon River, and over all main bodies of water in South America.

Later on there will be shipped to Captain O'Neill at Rio a Boeing

combination mail, passenger, and express plane. This type carries two passengers besides the pilot, and is the same type as is now operated between San Francisco and Seattle on the regular mail run. This plane, Captain O'Neill believes, will fill the long-felt need in the South American countries for reliable and dependable air service.

These three planes will be displayed in all countries in South America. The Boeing people feel that this demonstration and display will open up a wonderful opportunity for a large and extensive business in that territory. The types of planes taken are an assortment embracing all necessary for most every purpose desired in these countries.

When the West Cactus arrives in Rio and the pursuit plane is delivered to Captain O'Neill, it will mark the first time in the history of aviation and shipping that an airplane has ever been carried from the Pacific Coast to the East Coast of South America. It is a great stride in the progress of Pacific Coast commerce in general, and speaks well for the pioneering, each in its own field, which the Boeing Airplane Company and the McCormick Steamship Company are doing.

str. Kurdistan, same, 30/-, prompt, Kerr Gifford & Co.; British str. Min, same, 30/-, option Portland 31/3, Mar., Kerr Gifford & Co.; British str. Roxby, Portland to U. K.-Continent, 33/-, Mar., Heatley & Co.; British str. Brighton (or sub.) Vancouver to Antwerp and/or Rotterdam, one port 31/-, two ports 31/9, option Prince Rupert loading 9d. extra, Mar.; British str. Demeter-ton, Vancouver to Antwerp or Rotterdam, 30/-, option Hamburg 30/6, Mar.; British m.s. King James, same; a Smith str., Vancouver to Antwerp or Rotterdam, 30/3, Mar. option Hamburg, 30/9; two ports discharge -/9 extra, March; Japanese str., . . . Mar., Vancouver to U. K.-Continent 31/-, Antwerp or Rotterdam -/6 less Mar.; British str. Fishpool, Vancouver to U. K.-Continent, 30/6, Mar.

The Japanese str. Ypres Maru (or sub.) is reported fixed with wheat from Vancouver to Shanghai and the Japanese str. Ryoka Maru from Portland to Japan, Mar., Mitsubishi Co.

The Japanese steamer Toki Maru is reported fixed from Columbia River to Australia, Feb. loading.

The following steamers are reported fixed with lumber to the Orient: Japanese str. Ohkuni Maru, Columbia River and North Pacific to two ports Japan, \$9.30, Feb., Yamashita Co.; Japanese str. Ypres Maru, British Columbia to Shanghai, \$10, Feb., same charterers; Japanese str. Toyokawa Maru, Puget Sound to 2 or 3 ports Japan, \$9.40, Feb., Mitsui & Co.; Japanese str. Koki Maru, Coos Bay and Columbia River to Yokohama and Osaka, Mar., Yamashita Co.

The American str. Lake Gorin is reported fixed from the North Pacific to the North Atlantic at \$12.50, March loading.

The British str. Cape Ortegale is reported fixed from Columbia River with lumber and merchandise to Hamburg, Feb./Mar. loading, Canadian American Shipping Co., and the British str. Kirmwood from Grays Harbor and Puget Sound to Rotterdam and Grimsby with lumber, Feb. loading, same charterers.

The following tanker fixtures are reported: American tanker Cities Service Petrol, California to Tok-yama, 68c. early Feb., fuel oil; American tanker Antietam, California to Far East, 68c. April loading.

The American steamer San Pedro is reported fixed with ties from Eureka to La Union and San Jose

Freights, Charters, Sales

February 15, 1928.

THE following steamers are reported fixed with grain to the U. K. - Continent: British str. Bridgepool, Vancouver to U.K.-Continent, Feb., Canadian Cooperative

Wheat Producers; British str. Fernmoor, same; British str. Brad-avon, same; British str. Pearlmoor, same, 30/6, Mar., Canadian Cooperative Wheat Producers; British str. Trelawny, same, Mar.; British



Who's Who afloat and ashore

Edited by Jerry Scanlon.



P. A. S. Franklin, head of the International Mercantile Marine Company and one of the best-known steamship leaders in the world, was extensively entertained while in San Francisco.

Captain Robert Dollar, president and R. Stanley Dollar, vice-president and general manager of the Dollar Steamship Company, were hosts to Mr. Franklin at a luncheon which was attended by the foremost steamship men and leaders in all branches of business in San Francisco.

Mr. Franklin in his talk stated that the Panama Canal tolls were excessive, and stated that the United States Government should take means to remedy the tolls situation.

Winfield M. Thompson, publicity director for the International Mercantile Marine Company, who formerly was in the New York office, has been named field agent for the Panama-Pacific Line, and he will make his headquarters on the Pacific Coast.

Leo Gallagher, purser of the Pa-



P. A. S. Franklin, president International Mercantile Marine Company, snapped on board the steamship California on her maiden voyage.

nama-Pacific liner California, is the son of Charles I. Gallagher, who was chief engineer on a number of the American Line's first ships operating in the Atlantic service.

G. H. Gaskin, superintendent en-

gineer of the Panama-Pacific Line, watched the performance of the California's engines on the maiden voyage from New York to San Francisco. Mr. Gaskin is now busily cooperating with electrical engineers of the General Electric Company in the plans for the engines for the liner Virginia, sister ship of the California, which is under construction.

Appointments of officers to various commands of Matson Navigation Company vessels now in effect include: Captain Henry Speller as master of the freighter Manulani from the Makiki; Captain G. B. Wait from the Mana to the Makiki; Joubert B. Hurd, promoted to purser of the Matsonia from the Manoa; H. B. Meyer, formerly assistant purser of the Malolo, to purser of the Lurline; Jack Fishbeck, as purser of the Malolo, relieving H. W. D. McKenzie, who returns to the Maui, his old berth; and A. O. Marack, formerly freight clerk on the Maui, to purser of the Manoa.

Captain J. H. Trask, veteran transpacific master, who was off for a voyage as master of the Sierra, sailed outward from San Francisco on the liner Sierra early this month. Captain Trask was confined to a hospital by a severe illness for several weeks, but is now fully recovered.

Matt J. Lindsay, freight traffic manager of the Matson interests, is back at his desk after a month's business trip to Hawaii.

Sale of the Spreckels' yacht Venetia to James Playfair, Canadian sportsman, recalls the fact that this splendid yacht was credited with sinking the German submarine J 20, which was alleged to have been the underseas craft that sunk the Lusitania off the Irish coast in 1915. The sale price of the Venetia was not revealed in the deal.

Commander Harrold Cunningham, who was appointed as master of the liner Leviathan, succeeding Commodore Herbert Hartley, is



Members of the International Shipping Conference, held in Washington, D. C., in connection with the International Radio Conference.

Standing in the rear row, left to right: Baron W. von Ahlefeld of Bremen; Raymond Girardeau of Paris; Edwin H. Duff of Washington, D.C. (representing United States private shipowners); Michael Brett of London; Th. P. van der Berg of Amsterdam.

Sitting, left to right: Captain Christopher Meyer of Norway; W. H. J. Oederwald of Amsterdam; W. A. Souter of London; H. C. Moore of Washington, D.C. (representing United States Shipping Board.)

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well-known in San Francisco shipping circles. He was in command of the liner Mount Vernon when that craft first arrived in San Francisco as a troopship after the close of the World War.

Tribute to electric propulsion is paid in a report of inspection of the electric drive on two Pacific Coast ferryboats after four years of service. These boats, the San Leandro and Hayward, were put in service by the Key System Transit Company in 1923 for operation between San Francisco and Oakland. Each propulsion equipment consists of a 1000-kilowatt, direct-current, geared turbine generator set, two 1200-horsepower, direct current motors, and a control panel providing control of speed and reversal of the motors from the engine room. General Electric furnished the equipment.

The San Leandro still holds the record for speed between ferry slips with a run of 12 minutes 53 seconds, the report stated. So excellent is the condition of the equipment on the two vessels that it is anticipated that another inspection will not be necessary for four years. The two vessels are conservatively estimated to have traveled 150,000 miles, maneuvering every 2.56 miles.

Sailings every ten days may be arranged by Swayne and Hoyt, Inc., for their Gulf-Pacific Line following purchase by this company of the steamers Neshobee and Riverside Bridge from the United States Shipping Board. The vessels will be brought to the West Coast at once and probably renamed the Point Concepcion and Point Dalgada.

Three leading figures in the shipping world of Japan are expected to arrive in San Francisco early in April. The trio consists of Baboru Ohtani, managing director; Y. Nagashima, chief of the passenger department; and S. Nakasa, purchasing agent, respectively, of the Nippon Yusen Kaisha. The trio will make a tour of the Pacific Coast and then proceed to the eastern seaboard. It is stated that their visit is in connection with the proposed improvement of the company's American service. The party will be greeted upon their arrival in San Francisco by Takeo Yamamoto, manager of the San Francisco office.



G. H. Gaskin, superintendent engineer of the Panama Pacific Line.

Edgar Stahl has been promoted to the position of general passenger agent for the N.Y.K. Elliot J. Spear, formerly with the McCormick Steamship Line offices in Los Angeles, has joined the Southern California passenger department of the Nippon Yusen Kaisha.

Pacific Coast headquarters for the Royal Packet Navigation Company have been established in San Francisco, with D. A. Vonk as general passenger agent. Vonk states that the trade possibilities between the Pacific Coast and the Dutch East Indies are unlimited, and that efforts are being made to make the Indies a popular tourist center.



Chief Engineer John Carstairs of the new Panama Pacific liner California

Executives of the Matson Navigation Company were highly pleased with the remodeling of the passenger accommodations of the liners Maui, Matsonia, and Manoa. The work on the Manoa was supervised by L. L. Westling; on the Matsonia by J. R. Selfridge; and on the Maui by John Dick. The work was under the general supervision of G. K. Nichols, manager of engineering and repairs, and M. R. Hickman, superintending engineer.

Tatsuma Steamship Company, Ltd., has purchased the 9600-ton (deadweight) steel steamship Iatsuba Maru, formerly the Corby Castle. The vessel will be added to the Walker-Ross fleet, operating between Northwestern ports and the Orient. The announcement was made by Herman Ross, member of the firm. The vessel is the fourth purchased by this company in the last two years, all of which have been steadily employed in Walker-Ross service to the Orient.

James V. Mason, head of the Portland Marine Supply Company at Portland for many years and a figure well known in Pacific shipping circles, passed away on February 1, as a result of injuries suffered following a fall down the ladder of the steamer Westmoor ten days previous. Mason had disposed of his marine supply holdings and was interested in stevedoring operations when his death occurred.

James Carpmill is now second engineer aboard the liner Venezuela. Carpmill has just received his second engineer's papers. He is well known among the engineering fraternity sailing the Pacific.

Mariners learned with regret of the passing recently of Captain George Dettmers, who was widely known as a master of ships plying the coastwise service. Captain Dettmers, a native of Germany, was skipper for many years aboard the lumber carriers Cosmopolis, Marshfield, and Davenport.

Among the widely-known engineers who were aboard the Panama Pacific liner California watching the performance of the electrical equipment were E. J. Berg, L. K. Rask, I. W. Van Brunt, and W. G. Gardner of the General Electric Company, who supervised electrifying the new liner. The quartet

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were greeted when the California reached Los Angeles by C. M. LeCount and R. F. Monges of the San Francisco offices of the General Electric company. During the stay of the four experts in San Francisco they were extensively entertained by General Electric officials.

Chief Engineer John Carstairs, of the new Panama-Pacific liner California, stated upon his arrival that the vessel behaved splendidly and that the engine room was the finest he had been in during his entire life at sea. Chief Carstairs is well-known and popular among the engineering fraternity on both the Atlantic and Pacific Oceans. "Quite a difference between the California's engine room and those on steamers when I first started to sea," remarked the genial engineer.

The old steamer Arizonan, of the American-Hawaiian fleet, recently bid San Francisco good-bye for the last time, for it is not likely she will see this part of the world again. A veteran of the A-H fleet, the Arizonan, now considered too small for the fleet, has been sold to Japanese purchasers, presumably for scrapping purposes, and she will be loaded with a full cargo of lumber on the Columbia river by the Hammond Lumber Company and dispatched to the Far East to be turned over to her new owners.

Buenos Aires will soon be the address of F. W. Relyea, former traffic manager for the United States Shipping Board, who had his headquarters in San Francisco. Relyea will relieve R. A. Gibson, director in South America for the Board.

A last requiem will be sounded soon for the sea-wracked bones of the seven United States Navy destroyers on the rocks at Point Honda, where they piled up in a heavy fog with the loss of 23 lives in September, 1923. Passing trainmen have been pointing out the scene of the wreck and the wreckage itself and perpetuating the memory of a terrible disaster. Burial of the remains of the destroyers under the waters they once rode so gracefully will be accomplished either by aerial bombing or by the placing of explosive charges in the shattered hulls. The work of burying the destroyers was turned back on the navy by the failure of a contracting firm to salvage certain mater-



Captain Makepeace Ridley of the Dollar round-the-world liner President Van Buren.

ials and destroy the hulls. Extension of the contract was granted from time to time, and finally it was cancelled.

The arrival of the French Line steamer Zenon on the Pacific brought the news that six 10,000-ton motorships will be constructed for the European-Pacific Coast ports service of this company. Officers of the Zenon stated that two of the vessels will be ready for the service in one year. The volume of business handled by the French Line since entering the service to Pacific coast ports has increased tremendously, and officers of the company declare that larger and faster ships have been needed for some time. The French Line ships are strictly freight carriers, but the new vessels will be constructed to take care of sixty passengers.

The passenger business in the direct Pacific Coast-European trade



Three engineer officers of the popular Lasso liner City of Honolulu snapped at Los Angeles Harbor. Left to right, 1st Asst. H. E. McEwing, Chief C. C. Bentley and 2nd Asst. Lockhart.

has become quite an important factor in the operation of the foreign line fleets engaged in this route, and of recent months has caused not a little anxiety among the transatlantic lines, who have passenger representatives on this coast investigating the amount of passenger traffic leaving on the direct routes.

Captain B. Aillet, it is believed, has convinced high officials of his company of the necessity of placing modern passenger and freight motorships on the direct routes.

The 1928 sailing schedule of the Nippon Yusen Kaisha was inaugurated with the liner Taiyo Maru, which sailed on Wednesday, February 15. For five years during the regime of the old T.K.K. and since the N.Y.K. took over these trans-Pacific liners the ships have been leaving San Francisco on Tuesdays at noon. The change allows the vessels of this line an extra day in port.

Changes in the engineering department of the Panama Mail liners Colombia and Venezuela are now in effect. Chief Engineer William Sykes of the liner Colombia was shifted to the Venezuela, relieving John A. McDevitt, who has been assigned to remain shore-side awaiting orders. Charles Kuhn, formerly with the General Engineering and Drydock Company, went out in chief engineer Sykes' berth on the Colombia.

There has been no appointment by the Panama Mail Line of a port captain to succeed the late Captain Ryland Drennan. Daulton Mann, general manager, stated that no such appointment would be made at present. Merle C. Johnson, formerly chief engineer, who has been serving as port engineer, is carrying on the work of ship operation from pier 46, San Francisco.

The Panama Mail Line has established its own offices in San Salvador, with E. J. Brown in charge. Brown is agent for the Panama Mail in Central America. He is widely-known in Pacific Coast shipping circles, having been attached lately to the Los Angeles offices of the Company, and was also for many years in Manila for the old Pacific Mail Line.

C. C. Mallory, assistant general manager of the Panama Mail Line, returned from a six weeks inspection

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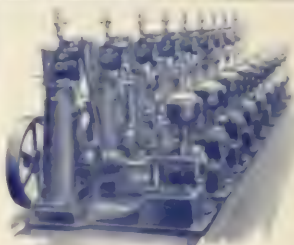
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tion tour of the offices and agencies in the Spanish Americas. Malory reported that business conditions in Latin American countries were in a healthy state, and that business men were optimistic.

On his first pleasure cruise, Joe Barker, port engineer for the Matson Line, is bound for the South Seas and Australia, accompanied by his wife and daughter. This is the first pleasure cruise "Joe" has ever taken. For forty-three years he has directed the operations of an engine room crew.

A strange procession of members of the "Shoeshine Club" staged a weird parade for Joe's benefit. The "Shoeshine Club" is composed of notables in the shipping world and Joe's lifelong friends. The procession was led by two cross-eyed negroes carrying a "bum voyage" banner, and included "Sandy" McDonald, United Engineering Company official, dressed in kilties, playing the bagpipes, and a clamoring Chinese band, followed by 100 friends of Barker. Tears came to the eyes of the veteran chief engineer when he recalled, with his shipmates, days spent in the engine rooms of the Enterprise, Lurline, Porter, and Algoa, and of the Maui and Wilhelmina, whose engines he installed.

Those present at Barker's sailing included Joseph Dolan, U.S. inspector of hulls and boilers; Frank Evers, American Bureau of Shipping; David Miller of Lloyd's; Edward Brady and Luke Bevans of the Eureka Boiler Works; Murdock Murray of the Dollar Line; and Port Engineers Henry Gelhaus of Swayne and Hoyt, and Jack Clemens of the Admiral Line. Phil Sheridan of the Andrew Mahony fleet, and James Bullock of the Dollar line also came down to bid "bon voyage" to their old friend.

The death of Captain Edward D. Hickman, veteran Seattle mariner, was recently reported from that city. Captain Hickman passed away on January 23 following a lingering illness.

Tom's Dixie Kitchen, famous Manila resort, where Army and Navy and business folk of the United States gather nightly to escape the tropical heat, was the scene of a dinner and celebration in honor of Chief Steward John Robertson of the Dollar Line steam-



Ivar Chillman, a resourceful shipbuilder of Hooquiam, Washington.

er President Lincoln on the vessel's last visit there. Old-timers who had been in the islands since '98 entertained the veteran steamship man, and many celebrities of the business, banking, and professional life of Manila were present. Eddie Tait, veteran boxer and promoter of Manila and owner of the famous stadium of that quaint city and lifelong friend of Robertson, was among those present.

After a lingering illness, William A. Trennell, chief clerk for the Nippon Yusen Kaisha at San Francisco, died on February 18. Mr.



Fred H. Oberschmidt, recently appointed Pacific Coast Manager for the Cutler-Hammer Mfg. Co.

Trennell's passing was lamented by hundreds of his friends along the waterfront, and he was known to officers that sailed from San Francisco to all parts of the world. For years Mr. Trennell served the old Toyo Kisen Kaisha, and when the affairs of this company were taken over by the Nippon Yusen Kaisha, Mr. Trennell remained with the Japanese line.

Captain C. W. Saunders, operating manager for the Matson Navigation Company, has returned from his yearly inspection tour of the Hawaiian Islands.

J. Rypperda Wierdsma, president-director of the Holland American Line, was a recent visitor to Pacific Coast ports. While in San Francisco he conferred with Pacific Coast chiefs of his line and outlined plans for 1928-29. It is fifteen years since this veteran steamship official had been on the Pacific Coast, and he expressed amazement at the Midas-like changes wrought. Wierdsma paid glowing compliments to the growth of Pacific shipping, and before leaving Seattle for Rotterdam declared that he would have an important announcement to make shortly after returning to the main headquarters of the line in Holland.

The regular monthly meeting of the Oakland Traffic Club was held at the Leamington Hotel on the evening of February 21, at which time 65 members were present.

H. W. Klein, assistant general freight agent of the Southern Pacific Company, was the principal speaker of the meeting, giving a constructive discourse on "Rate Structures and Classifications," explaining the origin and developments of rate structures in California.

Mr. King, of the Oakland Post Office, gave a very constructive talk on "Parcel Post and Postage in the United States," explaining the gigantic business enterprise which the government has entered into in handling mail and parcel post packages.

Recent incorporations include:

Auto Ferry Co. of Coronado, San Diego, Calif., to operate a ferry system between Coronado Beach and San Diego. The firm is capitalized at \$750,000 by W. A. Gunn, W. W. Crosby, and W. B. Neill.

Port Construction Notes

Seattle. The Western Dredging Company of Seattle was low bidder at 28 1-2 cents a cubic yard on bids recently opened for dredging 125,000 cubic yards in East Basin Channel to a depth of 32 feet. Major P. C. Gross of the U. S. Army Engineers is in charge of the work.

Victoria. Construction of a new terminal warehouse and cold storage plant to cost \$1,000,000 will be started in February. The plant is being backed by fish interests of Victoria and Seattle and will be financed by New York banks. Roger D. Pinneo, manager of the Seattle Merchants Exchange is one of the chief promoters. H. G. Brown is in charge of the project.

Vancouver. The Board of Harbor Commissioners of Vancouver, British Columbia, will call for bids soon for the construction of a lumber assembly and loading wharf on the waterfront at North Vancouver. The plans have been approved by the Dominion government and the wharf, when completed, will be leased to the H. R. McMillan Export Company, Ltd.

Olympia, Washington. P. Manson, piling and wharf contractor of Seattle recently received a contract from the Olympia Port District for a 150 foot extension to the port dock. This will give the dock a length of 1250 feet and berthing space for three large lumber carriers at one time.

Portland. The Commission of public docks has authorized the expenditure of \$140,000 for repairs to terminals Nos. 1, 2, and 4 during the next six months, with the probable addition of an auto-crane to the equipment.

Richmond. Plans for the new wharf and sheds to be constructed on the Richmond inner harbor by the Parr Terminal and the City are expected to be ready by February 1, according to H. J. Brunnier, San Francisco construction engineer in charge of plans and construction work. Award of contracts for the work will be about April 1, which are expected to be in the neighborhood of \$480,000.

The Petroleum Securities Company of Los Angeles is taking borings at Richmond harbor adjacent to Wharf No. 1 at Ferry Point with the idea of building shipping terminal at this point. Erection of oil

storage tanks is being rushed at the company's new storage site at Point Potrero, and shipments are expected to start February 1. Frank B. Seaver is construction superintendent.

The federal government has indicated its intention of soon starting dredging work at the harbor to increase the depth of water to 32 feet.

Los Angeles. The Harbor Commission has approved the construction of a 100-foot extension to Berth

174 occupied by the American Hawaiian Steamship Co.

The Harbor Commission has started consideration of a development project for the West Basin, which would entail the construction of sufficient docking space for nine ships, but would entail the changing of the bulkhead line by the Army Engineers.

The Western Oil and Refining Company will construct a loading station on the West Basin to cost \$53,000.

The First Leviathan

(Continued from Page 121)

The screw engines were designed and constructed by Watt and Company, and were of the horizontal direct-acting type, of 1600 nominal horsepower, but indicated 4886 horsepower. The weight of the engines was 500 tons. There were four steam cylinders, each 84 inches diameter by 48 inch stroke, driving two cranks at right angles on the shaft, and the mean number of revolutions per minute was 38.8. Each cylinder had two piston rods and a cross head which moved in guides; from the crosshead of each of the starboard engines proceeded one connecting-rod to a crank-pin, while from the crosshead of each of the port engines two connecting-rods proceeded; so that there were three connecting rods to each of the cranks. Between the cranks a balance weight in the form of a disc was introduced.

There were four jet condensers arranged between the cylinders, with horizontal air pump worked from the crossheads. Circular doors were placed on the ends of the condensers opposite to each air pump, through which access to the air pump valves could be obtained or the buckets be withdrawn. The vacuum maintained was 25.5 inches.

The slide valves of opposite cylinders were directly connected by a frame, to which motion was imparted by the usual link motion reversing gear. The weight of the link was counterbalanced by a chain, and it could be moved either by a hand-power screw-gear or by a steam reversing gear which had vertical trunk cylinders. The slide valves were of the gridiron type,

and on account of their great weight were borne on rollers. The pressure on the valve faces was reduced by a circular relief frame and ring, formed on the back of each valve, and sliding on the inside surface of steam chest cover.

Steam to these screw engines was supplied at 25 pounds pressure by six double-ended tubular boilers of the rectangular or box type, each 18.5 feet long, 17.5 feet wide, and 14 feet high, giving a total of 72 furnaces and a heating surface of 5000 square feet. Each boiler weighed 55 tons and contained about 45 tons of water.

The propeller was a four-bladed cast iron screw 24 feet diameter, 44 feet pitch, and weighed 36 tons. The propeller shafting was 150 feet in length and weighed 60 tons.

In order that the speed of the ship might not be retarded by the screw propeller when under way with paddles alone or paddles and sails, two auxiliary engines of 20 horsepower each were placed about the screw engine room to keep the screw shaft revolving when disconnected from the main engines. A trial of the ship under the screw alone gave a speed of 9 knots. It is now considered that the resistances of both the paddle wheels and the screw were too great for their respective engines, so that the latter never attained their full rated speeds.

The data herewith given may be accepted as conclusive and exact, and can be used with impunity in discussing that mess-room bugaboo, the Great Eastern.

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British Port Administration

(Continued from Page 101)

(c) Certain powers and duties of the Watermen's Company in connection with the registration and licensing of craft, the licensing of lightermen and boatmen, and power to make governing regulations.

Powers of Harbor Authorities. The principal powers conferred on harbor authorities by law are as follows:

(1) Power to charge dues on ships using harbors, and on goods handled therein. There is a corresponding responsibility for maintaining the harbors in proper condition.

(2) Power to make by-laws and regulations with respect to navigation in the harbors. Such powers are sometimes conferred specifically, by local Acts; e.g., the Mersey or Humber rules as to lights, signals, etc.

(3) Special power to regulate shipping carrying explosives, petroleum and other dangerous goods. General power conferred on harbor masters to regulate the berthing and movement of shipping in harbors, but not in a manner contrary to Customs regulations.

(4) Power to provide:

(a) Lights, buoys, and beacons for the safety of navigation;

(b) Harbor and dock police for security of life and property; .

(c) Meters and weighers for the convenience of merchants and shipowners.

Transport Ministry. The powers, provided for by the following Acts of Parliament, are now exercised by the Ministry of Transport in respect of harbors:

(1) The General Pier and Harbors Acts, 1861 and 1862. The making of Provisional Orders authorizing:

(a) the construction of piers, harbors, etc;

(b) the levying of pier and harbor rates;

(c) the borrowing of money for the purposes of piers and harbors.

These orders do not take effect until they have been confirmed by Parliament.

(2) The Harbors and Passing Tolls Act, 1851:

(a) Approval of loans to harbor authorities by the Public Works Loans Commissioners;

(b) Power to purchase lands by agreement when required for the public service.

(3) Petroleum Acts 1871 and 1879:

Approval of by-laws made by harbor authorities as to the mooring of ships carrying petroleum, and as to the landing of petroleum.

(4) Explosives Act 1875:

Approval of by-laws made by harbor authorities relating to the construction and navigation of ships conveying explosives, and the loading, unloading and handling of explosives at harbors.

Note. (a) So far as the above Acts give power to control navigation such powers are still exercised by the Board of Trade.

(b) The Transport Ministry cannot grant orders to the Ports of London, Liverpool, Glasgow, Sunderland, Hull or Newcastle.

(c) Copies of Draft Provisional Orders must be deposited at the local Custom House by the promoters, for public inspection, as required by the General Pier and Harbors Act, 1861, secs. 4-5.

Port Authorities Constituted for the Purposes of Special Acts

Provision is made in certain Acts of Parliament for

the constitution of special Port Authorities for the administration of particular Acts.

(1) Port Sanitary Authorities. The various Public Health Acts of the United Kingdom empower the Ministry of Health, as the successor to the Local Government Board, to appoint Port Sanitary Authorities. The Ministry assigns to such authorities any powers, rights, or duties provided for by the Acts. The jurisdiction of a Port Sanitary Authority extends throughout the Port as established for Customs purposes. In some cases, however, an authority may have jurisdiction over more than one Customs Port; e.g. the Hull and Goole Port Sanitary Authority.

(2) Local Marine Boards. At the principal ports of the United Kingdom local marine boards have been established for carrying into effect the Merchant Shipping Acts, under the superintendence of the Board of Trade. The members of such boards consist of certain local municipal officers, Board of Trade nominees, and representatives of local shipowners.

(3) The Ministry of Agriculture and Fisheries under the Diseases of Animals Act, 1894, appoints local authorities to make regulations governing the landing and disposal of foreign cattle at ports approved for their importation. The local borough council or county council may act as the authority for this purpose, or a separate body may be appointed.

The Revenue Authorities

The Board of Treasury is, subject to Parliament, the supreme authority in matters affecting the national revenue. It has therefore extensive powers of control over the ports and harbors. Some of these powers are exercised direct, whilst others are exercised by the Board of Customs and Excise.

Appointment of Ports.

"The Treasury may, by their warrant, appoint any port, sub-port, haven, or creek in the United Kingdom, or in the Channel Islands, and declare the limits thereof, and appoint proper places within the same to be legal quays for the lading and unlading of goods, and declare the bounds and extent of any such quays, and annul the limits of any port, sub-port, haven, creek, or legal quay already appointed . . . or alter or vary the names, bounds and limits thereof."

C. C. Act, 1876, sec. 11.

A list of Treasury Warrants, issued under the above section, is printed in the official index to Statutory Rules and Orders, 1893, and continued in later issues. Such warrants were formerly issued by the Court of Exchequer as a Royal Prerogative.

The limits of a port are determined primarily for Customs purposes, but the phrase may have a wider application in commercial transactions owing to the "port authorities" exercising authority over wider limits.

The limits of the Port of London, for example, are defined for fiscal purposes as follows: "All places from high-water mark at Teddington Lock down both sides of the River Thames to an imaginary line drawn from Havengore creek (including as much of that creek and water-course as extends from it to the town of Rochford) to Warden Point, Isle of Sheppey, and up both sides of the River Medway to an imaginary line drawn from the west side of Coalmouth Creek, across the river to the east side of Stangate Creek."

The limits of the Port of London for the purposes

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History of the ...

The Commissioner of Insurance and Finance says that while he is in the United States, he is not in a position to make any statement on the subject of the proposed legislation. He says that he is not in a position to make any statement on the subject of the proposed legislation.

[illegible]

Control got 22 total points that perfect during the morning practice on the principal parts and motion. The correct are illustrated at the bottom. (Figure 1)

This Quarterly Journal has been published by me

20. *See* also *United States v. Gurnea*, 200 F.3d 1008, 1014 (9th Cir. 2000).

[illegible]

WILSON, C. J., JR.

The construction of a dam and a bridge have also given impetus to the cattle trade, whereas the lack of rainfall and shortage of hay in the north have again stimulated the movement, and in some quarters the price of cattle has been paid for almost as high as in the south. In the latter section the cattle trade is still active, but the price of cattle has fallen to about the level of the north, and the movement of cattle has been less brisk than in the north.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Treatment Sheds and Treatment Shed

Source: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, 1997, 76, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839,

[illegible]

80% decrease of bonded and temporary points in the network in the observed segment.

Unemployed Persons: 3,000,000 and 4,000,000.

places not duly approved. Request must be made on Form No. 200a C. to the Collector of the port in which the unapproved place is situated. A deposit must be made at the same time to cover any expense incurred by the Crown in connection with the work of loading or discharging.

Bonded Warehouses

"The Treasury may by their warrant appoint the

ports and coastal business houses in the United Kingdom, have indicated that internationalization is a priority. One of the companies in the business sector with business interests in the United States (Internationalization of Commerce and Culture) has indicated that it will create regional and national networks in different countries. When given the opportunity to establish long and short-term relations, it has opted for the first route. However, in the long-term view,

D. C. Das, 1993, vol. 13.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

[illegible]

The official list of teachers and their addresses appearing in the following table is from the list furnished by the National Education Association.

James Macpherson

The Eastern Division has two major job units, but there are many other units. The units are: (1) the various parts of the company, and (2) the various divisions. Each division has its own headquarters, and has its own staff. The company headquarters is located in the city of New York. The company headquarters is located in the city of New York. The company headquarters is located in the city of New York.

Under the Minnesota Statute that sets out the rules of behavior for a Governor's term, the Governor is required to "conduct himself in a manner that is consistent with the public interest." At the same time, the Governor is required to "conduct himself in a manner that is consistent with the public interest."

Stephen, William, Clerk

1. 1990-1991 11.1.1991

[illegible]

Approved for Release by NSA on 09-11-2013 pursuant to E.O. 13526

C.C.A., 1982, vol. 42 and *Reviews*, 42, 1982, no. 2.

12. The position of the following points, which have been constructed by means of the above method, agrees with the construction of Goursat and Koenig.

als" as defined by the Diseases of Animals Act, 1894, may be landed only at ports approved by the Ministry of Agriculture and Fisheries.—D. of A. Act, 1894, sec. 30.

(4) Ports are approved for the Registry of Shipping by the Commissioners of Customs and Excise.—M. S. 400, 1911.

It is prohibited from importation and exportation except through ports approved by the Commissioners of Customs and Excise—Dangerous Drugs

5. The importation of tobacco is restricted to ports

(7) The importation of explosives is subject to a license issued by the Home Office. The explosives may be landed only at the port or ports specified in the license.

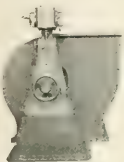
The landing of explosives and petroleum is also subject to by-laws made by the local Harbor authorities.

(8) The landing of aliens is restricted to certain seaports and airports by Order in Council.

**Dependable performance
is characteristic of all**



*Sturtevant Muller pump
Type for ship construction*



*Sturtevant Trained Draft
Blower and Engine*



*Sturtevant Marine Draft
Blower for ship heating*



*Sturtevant Tensioning
System for Engine
Room Auxiliary Pumps,
etc.*



*Sturtevant Monometer and
Exhaustor for Land and
Sea off blowers*



*Sturtevant Turbine for
engine room distribution
blowers, pumps, etc.*

Sturtevant Equipment

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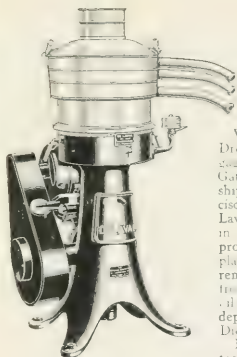
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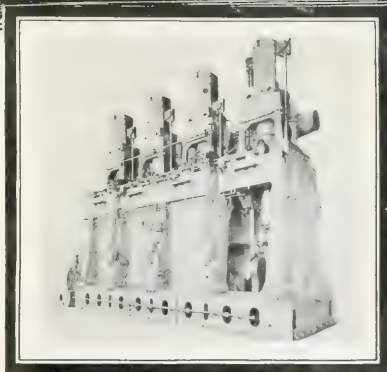
The National Magazine of Shipping

April, 1928



M. T. Mary Ellen O'Neil

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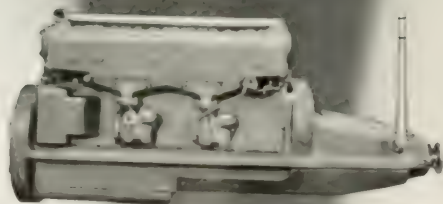
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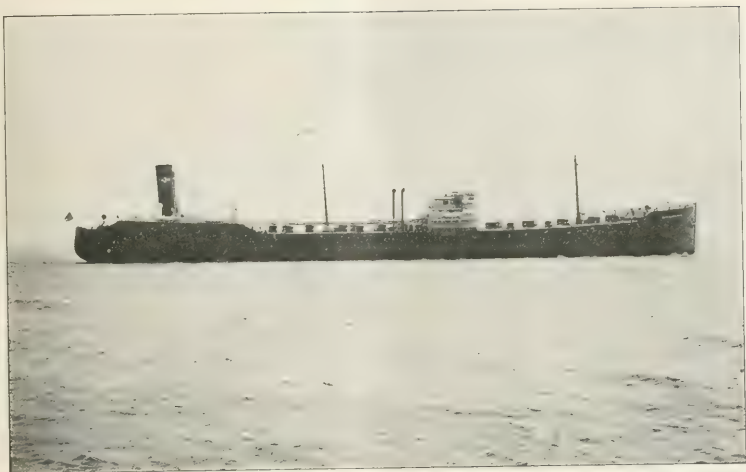
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American Motor Tanker Mary Ellen O'Neil

ON MARCH 17 the Sun Shipbuilding & Drydock Company of Chester, Pennsylvania, made formal delivery of the splendid new motor tanker Mary Ellen O'Neil to the California Petroleum Corporation at Los Angeles harbor. The Mary Ellen O'Neil was fully described and her complete general arrangement plans illustrated in the January issue of *Pacific Marine Review*.

The Sun Shipbuilding & Drydock Company launched this 17,000 deadweight ton vessel January 23, 1928, and held highly successful acceptance trials on February 21. She is built on the Isherwood Bracketless system, with an over-all length of 530 feet 4 inches. Her molded beam is 70 feet; her molded depth 40 feet; and her designed draft 29 feet 6 inches. She has a molded displacement of 24,070 tons, and on her designed draft has a cargo tank capacity of 5,900,000 gallons. In addition she has a dry cargo hold capacity of 78,095 cubic feet and capacity for 1500 tons of fuel oil.

The propulsion machinery consists of two Sun-Doxford opposed piston diesels, each of which develops 2100 shaft horsepower at 82 revolutions a minute. The combined power of these engines developed on sea trials a speed of 12.26 knots an hour.

Two Worthington 180-horsepower diesels, each connected to a Westinghouse direct-current generator, supply the ship with light and with power for electric auxiliaries. All of the engine room auxiliaries and the steering gear are electrically driven. The main cargo pumps, together with the auxiliaries of the steam boilers, are steam driven. A Foster marine water-tube boiler, with 4000 square feet of heating surface, equipped with Todd fuel oil burners, and a Sun Shipbuilding Company exhaust gas fired boiler of 1630 square feet heating surface are installed. The former supplies steam power for working the main cargo pumps and the steam deck machinery as well as heating the main and summer tanks, while the latter is used at sea for heating crew's quarters. Pumps were supplied by Worthington, electrical equipment by Westinghouse, steering gear by American Engineering Company, and refrigerating machinery by Brunswick-Kroeschell Co.



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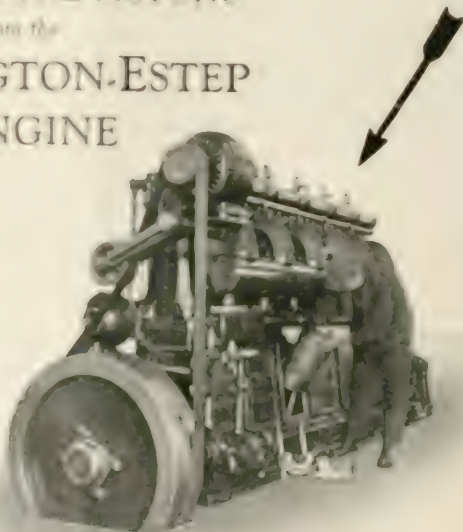
Simply remove the inspection
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Take off the two halves of the
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PLEASE MENTION PACIFIC MARINE REVIEW

Pacific Marine Review

The National Magazine of Shipping

Official Organ
Pacific American Steamship
Association

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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American Capital Financing Foreign Shipping

(Editorial from Chicago Tribune.)

THE statement of Representative Wood of Indiana before the house of representatives describes the disquieting condition of the United States merchant marine.

Of merchant vessels of 2000 gross tons or over for transoceanic service, built, laid down, or appropriated for, out of a total of 1000, the British Empire is credited with 741, Italy 91, France 80, Japan 71, and the United States 19.

Since the war, said Mr. Wood, American private loans to our former allies have totaled in the neighborhood of \$12,000,000,000, no small portion of which must have gone to build up foreign navies and shipping interests. In other words, the United States has been financing its own competition.

While the American merchant marine dwindles for lack of support, said Mr. Wood, the North German Lloyd Steamship Company is floating a \$20,000,000 loan in this country for ship construction, and a loan for the same purpose has been placed in this country by the Cunard Steamship Company.

The American merchant marine cannot get capital; foreign shipping companies can. It is obvious that foreign shipping is considered the better investment. Why?

It is not because American business genius is less enterprising. It is not because Americans do not take to the sea; they have in the past, and they will. Nor is it because foreign competition is too strenuous. In Europe's own home markets American trade has been able to go in and hold its own. In highly competitive markets such as some of the South American countries the United States has started behind and is now in the lead.

American shipping is a poor investment and failing because, instead of government aid such as shipping receives from governments abroad, it receives little but government interference and is hampered by unsound, socialistic legislation. American shipping will not come into its own until these obstacles are removed, until the blighting fact of government ownership is overcome, crippling legislation is repealed, and reasonable forms of government aid for service rendered are supplied. When this is done, then American transoceanic ships will be built and American capital will be ready to build and maintain them.

This is strong medicine, coming from an influential source in the great Middle West, and indicates some real ship-mindedness in that section. Editorials of this character

are valuable as offsets for the government ownership propaganda which seems to be so firmly entrenched in the councils of the farmers' cooperative societies.

What a fine Program Summary.

- (1) Government Ownership Overcome.
- (2) Crippling Legislation Repealed.
- (3) Reasonable Government Aid Supplied.

Opposes Jones Bill

Statement by Lewis E. Pierson,
President, United States Chamber of Commerce

MAKE no mistake about it. There is but one alternative to private ownership and operation of business, and that is government ownership and operation. Extend this process to its logical and inevitable conclusion and we fetch up at communism.

Government is within its province when it cooperates with business in the realm for which government was designed. Yet in the pursuit of these legitimate purposes government and business have unconsciously drifted toward a relation which is entirely apart from the original concept.

Government should stay out of business.

Specifically, the National Chamber opposes the Jones bill because:

(a) It would embark the government upon a new program for use of the taxpayers' money in merchant ship construction for government operation.

(b) It would prohibit sale of Shipping Board ships except by unanimous approval of the Shipping Board which, in view of the attitude of some members of the Board, would be the practical equivalent of stopping all sales of commercially useful ships.

(c) It would not further the establishment of our shipping in private ownership and operation, the only basis on which a permanent and successful merchant marine can be maintained.

A Remarkable Record

The Dollar Steamship Line of San Francisco is justly proud of the fact that its steamship President Adams started from New York on time at noon, February 2, 1928, her fourteenth round-the-world voyage. This vessel on February 7, 1924, inaugurated the Dollar round-the-world passenger service. During her thirteen trips she has kept faithfully the precise schedule laid down.

ing trade routes of the world and making long term contracts with private operators for maintenance of adequate service.

3. Compensate these operators by paying a sum comparable with the average losses sustained by the Shipping Board in its present operation.

4. Provide for the recapture of a certain proportion of profits over and above a commensurate return on the capital invested, for the purpose of additional ship construction.

5. Provide for an equitable distribution of mail contracts to encourage cargo ship operations.

6. Extension of the naval reserve to provide additional operating personnel for the merchant marine.

7. Provide for a continuing shipbuilding program in accordance with the best shipping knowledge of the day, with a construction loan fund which would provide loans for new vessels up to 75 per cent of the total cost; additional funds to be obtainable from the United States Treasury with a low interest rate.

United States Chamber of Commerce

The United States Chamber of Commerce strongly supports the main provisions of these two bills. This organization let it be known through A. B. Barber, manager of the transportation department of the Chamber, that it favors legislation which will enable essential American shipping services to be maintained on a permanent basis in private hands. This body particularly favored the trade route and mail contract provisions of the White bill and is opposed to that section of the bill which relates to the establishment of a government marine reinsurance fund.

The mail contract provisions of the White Bill are also acceptable to the Post Office department. W. Irving Glover, assistant to Postmaster-General Harry S. New, told the committee that the Post Office department wants facilities for the fast movement of ocean mails.

Furusetth Out of Sympathy

Andrew Furusetth, president of the International Seamen's Union, told the committee that he could not agree with the figures of the shipbuilding interests that American ships carried larger crews than the ships of other flags. He said it was a notorious fact that Japanese ships carried the largest crews. He also stated that he was "tired" of hearing it constantly stated that the American ship operators were at a disadvantage because they paid higher wages and furnished better quarters and meals for their crews. Mr. Furusetth referred to the recommendations for legislation on submitted to the shipping board by the American Steamship Owners' Association in January and said he agreed with the owners' contention that some aid should be granted to equalize the cost of construction here and in foreign yards. On the other recommendations in the report, however, he said he was not in sympathy. He opposed any form of subsidy to ship operators beyond a more liberal rate for the transportation of the mails as contemplated by the bill introduced by Senator Royal S. Copeland of New York. He said he favored the Jones Bill provision that government tonnage cannot be sold unless by unanimous vote of the Shipping Board. He also made the statement that the Seamen's Act is being obeyed in theory and disobeyed in fact. "When the courts demand the ship-owners to recognize it, they do. The LaFollette Act is not obeyed unless required by the courts," Furusetth said.

Private Ownership Best

During the course of the hearings, Chairman Wal-

lace H. White of the House Committee told the committee members and the representatives of the shipping industry that he had called at the White House and discussed the shipping situation generally with President Coolidge. He somewhat reflected the views of the President when he reiterated his opposition to the provisions of the Jones bill, and declared that his own views of the proper legislation is contained in his, the White bill. He said his measure proceeds on the assumption that the American people prefer private operation of ships to government ownership and operation.

Issue Up To Senate

Unless something unforeseen should arise when this issue of the Pacific Marine Review reaches its readers, a bill along the lines above suggested will have been reported to the House. This measure should experience no substantial obstacles in the House, and can be passed without material amendment. What the Senate will do with such a bill is distinctly uncertain. The measure on reaching the Senate will be referred to the Senate Committee on Commerce, of which Senator Jones of Washington is chairman. This committee, by reporting the Jones bill, and the Senate, by adopting the Jones bill, has indicated an entirely different view from that of the House as to how the merchant marine problem should be solved. Unless there is marked alteration of opinion in the Senate the consolidation of the White and Wood bills will not have the approval of the Senate committee or a majority of the Senate. In view of this patent condition it is highly probable that the Senate committee will do in this case what it did in the case of the Radio legislation a year ago—strike out everything after the enacting clause of the House bill and reinsert the provisions of the Jones bill as adopted by the senate. Such action would result in throwing the whole subject matter into conference and allow the conferees such a latitude as would permit unlimited trading on the controversial and incompatible views expressed in the Senate and House bills.

At the moment the majority of the Senate favors government operation and control. A majority of the House favors private operation and control with the gradual elimination of the government as a competitor. Unless the House or the Senate recedes from these respective positions hope for beneficial marine legislation will be extremely meager.

Subsidizing Government Competition

A compromise of these opposing views would afford little or no relief to private operators because any stimulation accorded to governmental operation is in reality a subsidy to the competitor of private operators even though that competitor is the United States government.



By NORMAN F. TITUS, Chief, Transportation Division,
Bureau of Education and Domestic Commerce.

It will be observed that, eliminating subsistence and fuel in port, the port costs of 36 days freight earnings absorbed by charges for pilotage, tonnage, dues, etc., added to the 115 days freight earnings absorbed by stevedoring, represent 41.3 per cent of the total freight earnings of the vessels. In the case of companies operating vessels on short runs, as in the coastwise trade, port costs may run as high as two-thirds of the entire operation.

In addition to an acknowledgment of the preponderance of port charges in the shipping business, authorities agree that stevedoring is the greatest variable. Obviously, then, we have in this loading and discharging operation our most promising field for exploration.

In pursuing any aspect of research, it is always the part of wisdom not to circumscribe the field of examination, but to envisage as broad a field as possible to determine whether or not others have worked out any method of procedure that would be helpful in solving the problem under examination. Such a review of the cargo handling operation throughout the world immediately impresses one with the fact that in handling general cargo in the United States there is a conspicuous lack of mechanical devices. This lack is remarkable when we consider that in other forms of industry American mechanical genius leads the world.

Along this same line, it is interesting to note that in 1925 the British became alarmed at the relative prosperity of Continental ports, and appointed a committee, representing twenty-five associations and federations, to determine the cause. This "Traders Coordinating Committee on Dock Charges" reported that the greater prosperity of Continental than of British ports was attributable to two main causes, namely, (1) improved equipment, and (2) lower costs.

This instance is evidence of the deep significance of mechanical equipment. At this point the mechanical engineer and the ship operator join forces.

In considering mechanical devices in cargo handling, the subject may be examined from three aspects, as follows:

(1) The relative advantage of ship equipment and port equipment for general cargo.

(2) Mechanical equipment of ports for handling bulk raw materials.

(3) Cargo transfer and handling on the pier.

In reviewing the world situation concerning these factors we find the following:

(1) **The relative advantage of ship equipment and port equipment for general cargo.** We are confronted immediately with the situation of the almost universal use of the ship's gear or the cargo mast for loading or discharging cargo in the United States while in Europe there is equal unanimity in the use of the quay crane. In explaining this fact, we recognize that this diversity of practice is brought about by the fact that, in America, the wharves are of the pier type and the sheds occupy practically the full width, leaving no space for railway sidings or for a crane track. Furthermore, many of our piers are built so lightly as to be unable to stand the heavy concentrated loading due to the installation of cranes. On the other hand, in Europe the quay is of solid construction and the shed set far enough back to permit of ample railroad trackage and abundant space for landing and sorting cargo.

These statements, however, are not the full explanation of the diversity of practice. What, then, are the further points in the case? Deeper consideration discloses certain other data. Thus, we find that in New York a firm bearing stratum cannot be reached generally by piles 80 feet long, whereas in other ports foundations of sufficient density are available. The best American practice now provides good, substantial piers with double tracks, obviously strong enough and with ample room to accommodate cranes. In many ports, therefore the opportunity is present for crane installation if the practice were acceptable.

Another vital consideration, from the American

viewpoint, is that inland waterways transportation is one of our most pressing issues and, unquestionably, we are on the threshold of a great period of barge transportation on our rivers and canals. This makes it imperative that unloading machinery on shore be provided for the barges. Thus it is important that our seaports affected by inland waterways transportation give the matter of crane equipment their most earnest consideration.

At this point, I must interject a new factor for our consideration. This factor is inland port development. In this country we are all familiar with maritime port competition; we accept as commonplace the issuance of bonds to the extent of millions of dollars for ocean port development. In Europe, on the other hand, this same port competition extends to inland ports. There, we find the same evidence of enormous bond issues for inland port improvement with a consequent construction of magnificent docks with a great abundance of mechanical equipment. In Germany alone there are 132 such improved inland ports. Such ports at Duisberg and Ruhrort have an ample supply of cranes, and are as busy as any ocean port. In the development of our inland waterways systems there is thus a wide opportunity for our mechanical genius.

Returning to a consideration of cranes, let us examine further facts concerning their utility. They are highly useful for unloading or loading flat or gondola cars as well as barges. Another important fact is that the crane equipment is generally supplied by municipal port authorities not looking for a large return on the investment. With amortization over a long period and a small interest charge, the crane cost is made very nominal.

The actual performance of cranes is quite remarkable. In European practice a discharge of 200 to 250 tons per hour frequently is accomplished; this rate of accomplishment is several times greater than that of ship gear. Speed of discharge is accelerated by the possibility of working more than one crane to the hatch. Manufacturers of cranes, in Europe, guarantee the cost of handling to be between 3 and 6 cents per ton, which, added to the cost of transferring the cargo to point of rest on the dock, totals 15 to 20 cents per ton. This presents a striking contrast to our usual cost of 50 cents to \$1.25 per ton for general cargo stevedoring. In the report of the Port Facilities Committee of the Chamber of Shipping of the United Kingdom, submitted in 1924, a searching analysis was made of European practice and it was stated that under exactly similar conditions discharge by cranes was 1/3 to 2/3 greater than by ship's winches.

It is quite evident that port design is a very important factor as well as the installation of the cranes. It was my experience last year to travel through ten countries of Europe studying shipping conditions, and one of the most striking things that I saw was the King George V Dock in London. The south side of the dock is laid out in the most novel manner. Seven dolphins, or reinforced concrete jetties, each 520 feet long and 22 feet wide, are placed at intervals at a distance of 32 feet from the quay wall and parallel to it. This outside dolphin, or pier, is thus virtually separated by a 32 foot canal from the quay. Vessels are berthed on the outside of the dolphins, which carry 18 electric luffing cranes used for discharging and loading operations. Barges lie between the dolphin and the quay, and also on the outside of the vessel.

(Continued on Page 152)

ed for another voyage. This was to the West Indies, and was accomplished successfully, the return voyage being to Boston from Remedios with a valuable cargo of sugar and molasses. On this latter run, seventeen bales of cotton were discovered one morning floating on the sea and were picked up. These were supposed to have been thrown overboard the day before by some hard pressed blockade runner and they were disposed of at Boston for a good price.

Following this voyage the Kitty Simpson was sent to New York, where she was sold, going under the French flag as the La Rose. Her subsequent career was, however, very short, she being wrecked in January 1865 while bound from Havre to Vera Cruz with coal for account of the French government.

Captain Mayo retired from active sea life about 1875 and for some years thereafter was engaged in the commission and warehouse business along the New York waterfront. After 1884 he made his home with his daughter, Mrs. M. M. Larrabee, in Emporium, Pennsylvania. This lady, when Miss Georgina Mayo, had celebrated her tenth birthday in Calcutta while making the voyage around the world with her father and mother in the ship Anglo Saxon.

As an incident of the Gray Feather's voyage in 1861, it is recounted that while the ship was at Colombo, first mate William Morey, a young man from Captain Mayo's native town, was stricken with a tropical fever and the ship was forced to sail without him. After recovering his health, Morey decided to stay in Ceylon and engage in business. He married a Singhalese princess and subsequently was appointed United States

Consul, being the first person to hold that position in Ceylon. He was Consul for thirty-two years until his death in 1908.

Captain Mayo was tall, powerfully built, and of a commanding appearance. He looked every inch the splendid mariner he proved to be. Although called a "driver," he never met with a serious mishap during a career of thirty years as officer or master. The training he had under such famous packet captains as Charles H. Marshall and Asa Eldridge was invaluable, and the copious notes he kept on his voyages were of much assistance in the compilation of Lieutenant Maury's "Wind and Current Charts and Sailing Directions," the publication of which did so much to shorten the passages of sailing ships on all world trade routes. Among shipping men and friends ashore Captain Mayo was familiarly known as Captain "Bart," and his wealth of experience, coupled with a frank and genial disposition, made him a welcome and entertaining guest wherever he went. His arrivals at New York each year meant a happy visit to that city for his wife and children, who came from Hampden to greet him and enjoy a two weeks' pleasure trip while he was engaged in supervising the discharge of cargoes and settling up affairs of the voyage.

Captain Mayo died in 1908 and rests amid the scenes of his boyhood in the old cemetery at Hampden, overlooking the beautiful Penobscot River. Above his grave is erected a bronze tablet bearing upon its face a replica of one of the beautiful clipper ships under full sail, upon whose decks he had loved to tread and where he had given a full measure of useful service to his fellow men amid the storms and perils of the deep.



The above is a reproduction of a painting of the ship Gray Feather by W. Francis of Belvedere, California.

The Gray Feather (often written Grey Feather) was a ship of 586 tons, 138 feet long, 30 feet beam, 19 feet depth of hold, built at Eastport, Maine, in 1850 by C. S. Husten for J. W. Bass. In 1852 she was owned by J. Boynton of New York, and in 1858 by L. H. Simpson and Brother of the same port. Although a small ship she carried a great press of canvas and her sailing record is good.

Mail Contracts and American Shipping

By Alexander R. Smith

FOLLOWING the successful trip of the American Steamship Savannah from Savannah to Liverpool and return in 1819, the first steam vessel ever to cross the Atlantic, Senator Sanford, in behalf of the Ocean Steamship Co. of New York, presented a memorial to Congress praying for the passage of a law to establish a steamship line and which authorized "the Postmaster General to contract with them for the transportation of the public foreign mails." This led to the introduction of a bill to establish such a line, which passed the Senate, but died in the House. All of this happened nearly a score of years before the British, in a practical manner, established the first mail steamship line in transatlantic trade.

First American Mail Contract

The first act of Congress relating to ocean mails was passed in 1836, but was limited to the coastwise service, and was a year before British steamships ran from Falmouth to Gibraltar.

On March 3, 1845, President Tyler approved of a bill (No. 42) that originated in the Senate, "An act to provide for the transportation of mails between the United States and foreign countries," which provided as follows:

That the Postmaster General of the United States be and he is hereby authorized under the restrictions and provisions of the existing laws to contract for the transportation of the United States Mail, between ports of the United States and a port or ports of any foreign country, whenever in his opinion the public interest will thereby be promoted, etc.

And further providing:

That all such contracts shall be made with citizens of the United States and the mail to be transported in American vessels by American citizens.

In Part 2 of a Report to the United States Shipping Board, made in December, 1926, the author of this article said:

In a memorial to Congress of the Chamber of Commerce of the State of New York on ocean navigation, issued in January, 1864, pursuant to a resolution of the Chamber adopted on November 5, 1863, in which appear a number of brief statements cataloging the American and British systems of steam navigation, we quote as follows:

The memorial then catalogues, chronologically, successive efforts to establish American mail steamship lines in foreign trade, mentioning, in their order: A contract made with Edward Mills, of New York to run a line of steamers from New York to Bremen twice a month, touching at Cowes, with the privilege of going alternatively to Havre, the compensation to be \$400,000 per annum; and if to Havre \$350,000.

A contract was made with E. K. Collins and others to Liverpool, to be paid \$385,000.

American Lines First

Successive other acts were passed, and additional lines established under them, a review of which is impossible within the space allotted for this brief recital. Nothing quite so succinctly and withal briefly presents the matter as does the memorial of the Chamber of Commerce of the State of New York, above quoted, and which brings the affirmative actions down to 1852. It then says: "It is doubtful whether ocean steam navigation would have been undertaken so early, but for aid in some form."

A "History of American Lines" follows, giving names of the lines, the types and character of the ships, far in excess of the governmental requirements, and in every way exceeding in speed, safety and com-

fort their foreign rivals. Says the memorial, in part:

Throughout the period of the competition of the Collins with the Cunard line, all the honor was with the former. Its steamers beat their English rivals nearly a day and a half on the average voyage. In nothing was American pride more interested and gratified than in this signal triumph of national industry and enterprise.

It is enough to say that this memorial was written while the Civil War still raged, but at a period when the decadence of American shipping had not yet become marked, or acute, despite the war and its ravages of our shipping.

Nothing could more accurately and graphically present the situation as viewed by the Chamber of Commerce at that stirring period. In a chapter in its memorial, on "Government Subsidies to Ocean Steamers," among other things it says:

In the beginning of the controversy the liberal view prevailed in this country. The general sentiment of the nation, justly stimulated by the triumphs which our steam lines rapidly achieved over all rivals, and by the continued successes of the American shipmaster, was clearly in favor of giving every encouragement to these enterprises. The disasters which overtook the Collins line—disasters beyond the control of mechanic or master—beyond the ken of government or owner—somehow dulled this enthusiasm, and strengthened the hands of a class of men who, changing their views from those which they had before entertained, determined that they would no longer support what they were pleased to call a tribute to Northern prosperity and Northern commerce. . . . Unfortunately their counsels prevailed, and the ocean steamers, in which the country took such a hearty and honest pride, are among the memories of the past.

In England, no such false policy has prevailed. From the year 1840, when the experiment of the Sirius having succeeded, the government set itself to work to bind in its chains the commerce of the world, there has been no hesitation or drawback on the part of the authorities. Repeated investigations have been had; volumes of testimony have been published; economists have attacked the system in vain. Endeavors have been made to stimulate the lines to support themselves, yet, what was the result?

Just as is stated, there was great enthusiasm in the beginning, the Government backed up the splendid American lines, whose ships had so worthily upheld American maritime ascendancy, the mail pay was increased time and again; then criticisms began to crop up, stifled at first, but they grew greater, they were followed by restrictions being placed upon the lines under contracts, then when their need was greatest, and their financial burdens heaviest, to which, unparalleled losses were in some cases added, notably the Collins line, the Government began reducing the amount of the mail pay, crippling the lines to an extent that made recovery seem impossible, and then, in 1858, came the total abandonment of adequate mail compensation, the ruin and withdrawal of most of the lines, in some cases the sale of their ships to foreign lines, and their continued operation successfully under alien flags for years thereafter. It is well summed up by the late Winthrop L. Marvin, in his spirited and invaluable work, "The American Merchant Marine," in which he said:

Great Britain stood loyally by her shipowners, and with constant and unceasing subsidy protection aided them over their years of trial and misfortune. We deserted our shipowners in their time of need, leaving them to fight singlehanded the hazards of the sea, the vicissitudes of the unfamiliar trade of steam navigation, and the treasuries of foreign governments. Who can wonder that they were beaten in this unequal contest, and driven from the sea?

The rapid rise and meteoric fall of the pitiful handful of American mail steamship lines in the single decade that preceded the Civil War seem to have laid a palsy upon American maritime enterprise from which

New Morgan Line Steamer Dixie

Fine Passenger and Freight Liner for Atlantic Coast Run of the Southern Pacific Steamship Lines

THIS latest addition to the fleet of the Morgan Line was designed by A. S. Hebble, superintending engineer of the Southern Pacific Steamship Lines, who had immediate charge of construction under the direction of Lewis J. Spence, executive officer of the Southern Pacific Company, who personally supervised the arrangement, decoration, and furnishing of the vessel. Plans of the vessel and a full description appeared in Pacific Marine Review for July 1927.

The Dixie was built at the Kearny, N.J., yards of the Federal Shipbuilding and Dry Dock Company at an approximate cost of \$2,400,000. The keel was laid January 31, 1927. The vessel was launched July 29, Mrs. Lewis J. Spence acting as sponsor, and the trial trip was made December 10, 1927. It is operated in the New York-New Orleans service, and made its initial voyage from New York, Saturday, January 28, 1928, in command of Captain Charles P. Maxson.

The Dixie is a single screw steamship with straight stem and semi-elliptical stern, rigged with two steel pole masts, built on the Isherwood system, with three complete steel decks fore and aft and a steel promenade deck with an orlop deck in addition in the forward hold extending from the collision bulkhead to after No. 1 hold bulkhead. The vessel is fitted with wing and center line hatches and side cargo ports.



A corner in the first class dining saloon on the steamship Dixie.

General Characteristics

Length, over-all	445' 0"
Length, between perpendiculars,	427' 0"
Beam, molded	60' 0"
Depth, saloon deck	37' 0"
Depth, to main deck	29' 0"
Mean draft, loaded	25' 6"
Designed sea speed, knots..	15½

Hull Arrangement

The vessel is fitted with a double bottom throughout. Double bottom tanks under the deep fuel oil tanks are used for fuel and for fresh water, ballast, and boiler feed water. Deep fuel tanks are arranged forward and alongside of the

fireroom and extend from the shell to the under side of the lower deck.

There are seven water-tight bulkheads extending to the saloon deck, and two oil-tight bulkheads extending to the lower deck.

All deck houses are of steel; those on the boat deck are arranged to carry first cabin passengers and to accommodate deck officers, engineer and petty officers, smoking room, observation sun parlor, and officers messroom; that located on the forward hurricane deck is to accommodate sailors, sailors mess, carpenter, boatswain, lamp room, and cargo winches. An expansion



The new Atlantic coast wise liner Dixie on her trials.

\mathbf{F}^* is a σ -finite \mathbf{F} . As a normed space, \mathbf{F} is separable.

[illegible]

with the same work habits as you, and you are not. Do not let the following become the excuse for your lack of success. Instead, attempt to change your attitude and work habits.

[illegible]

strong, off-white hairless, setting
green and with the setting green
being prominent with a subtle light
red tinge on upper leaflets and a
margin, which gives the foliage
one of a brilliant shiny appearance. A
number of leaf and root cuttings
in 1941 by Frank Meyer, a horticulturist
in the U.S.S.R.

Propulsion Machinery

This fine prospecting unit is an unusual feature of the fine, large-scale continental limestone, and is composed of thin, light gray limestone beds with thin, brownish, shaly or sandy interbeds. Through fracture openings in shaly sandstone areas, the blue gravel zone seems to be directly connected to the fine sandstone. The sandy limestone also is somewhat soft compared to the resistant beds of blue shaly limestone. Various sized clasts of fine sandstone in the shaly limestone are of varying sizes of 1/16 in. or smaller, and are a prominent aspect of the rock surface in outcrops. The sandstone is a mixture of fine, shaly



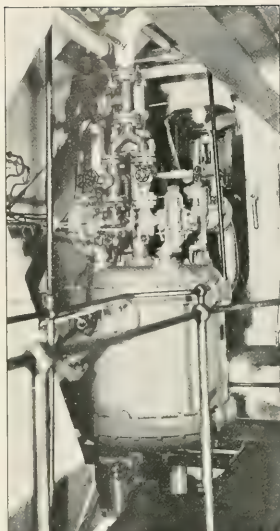
View of interiors of the palace rooms on the ground floor. Upper left: A stateroom in one of the suites. Upper right: First-class stateroom. Lower left: Lounge and dining room. Lower right: Observation sun parlor and dance room.

horsepower. The low pressure turbine exhausts through the bottom of its casing directly into the main condenser arranged athwartship immediately underneath the turbine. The astern turbines are figured to generate two-thirds of the full rated horsepower. Each turbine is fitted with a Kingsbury thrust bearing, and a main Kingsbury thrust bearing bolted directly to the tank top takes the thrust of the propeller shaft.

There are four Babcock & Wilcox small tube, marine type, oil-fired, water tube boilers built for a working pressure of 350 pounds per square inch and 200 degrees of superheat at the superheater, with a total evaporating surface of 21,180 square feet and 2048 square feet of superheating surface. Air heaters and a forced and induced draft system are provided. Each boiler is provided with five Cuyama type oil burners and with six Diamond soot blower units.

The boilers are arranged to operate under forced draft. The fans consist of two 78-inch three-stage bladed forced draft fans driven by 8 by 7-inch balanced valve engine. A complete induced draft apparatus is fitted in the stack above the air heaters, and consists of one No. 12 Sturtevant multivane, single width, single inlet, Design No. 3 fan, driven by Sturtevant A-8-G turbo-transmission. Each boiler is fitted with one air heater grouped above the boiler. The air heaters are fitted with tubes arranged so that the air makes two passages over the tubes. The air heaters are enclosed in a steel casing with an air space.

There is one main independent cylindrical condenser with wrought steel shell and cast steel forged ends, with 9500 square feet of cool-



Main condenser Wheeler Radojet air ejectors mounted on their inter-after condenser at the upper grating.

ing surface. The tubes and ferrules are of solid drawn Admiralty mixture. Tubes are made water-tight in tube sheets by screwed glands packed with corset lacing. A similar condenser of 1600 square feet of cooling surface serves the auxiliary power plant.

The main condenser is fitted with two two-stage C. H. Wheeler Co. Radojet air ejectors fitted with inter-after condensers provided with automatic drain control. The auxiliary condenser is fitted with one C. H. Wheeler Co. Radojet air ejector with after condenser pro-

vided with automatic drain control. The Radojets on the main condenser are independent and in duplicate. There is also fitted in connection with the main condenser two vertical turbo-driven condensate pumps arranged in duplicate.

The main circulating pump is of the centrifugal type with a normal capacity of not less than 16,000 gallons per minute. The diameter of the suction at discharge is 24 inches. The pump is operated by a single cylinder engine. The impeller is of brass and the shaft of Tobin bronze running in bronze bearings. This condensing equipment will maintain a vacuum of 28 $\frac{1}{2}$ inches with sea water at 65 degrees Fahrenheit.

The turbine bearings, gear bearings, Kingsbury thrust, and gear teeth are lubricated from a gravity lubricating system. This system is maintained by three Warren vertical simplex pumps, 8 inches by 10 inches by 12 inches, arranged so that two are working and one standing idle in case of emergency.

The lubricating oil in this system is kept pure by a De Laval lubricating oil purifier and is kept cool by two Andale lubricating oil coolers, served by a Warren vertical simplex pump. The pumps for circulating fresh water, sanitary drainage, evaporator feed, circulating for the refrigerator condenser, and for fire, bilge, and ballast are all Warren simplex or Warren duplex pumps.

Very careful attention was given to insulation on account of the high pressure and high temperature. All hot air ducts are insulated and all steam piping is double insulated with the insulation extending over all flanges and fittings on superheated lines.

This insulation was supplied by Thorsen & Company.

Auxiliary Power Plant

The steamship Dixie's auxiliary power plant consists of three De Laval-General Electric geared turbo-generating sets, one of 75 kilowatts capacity and two of 50 kilowatts capacity each. These furnish power for lighting for stateroom heating, for galley equipment, and for the Hyde hydro-electric steering gear.

For cargo handling, ten steam cargo winches are provided. These are the Hyde Windlass Company's 8 $\frac{1}{4}$ by 8-inch double cylinder, single drum, reversible type. The windlass and warping winch are also of the Hyde steam driven type.

The refrigerating apparatus con-



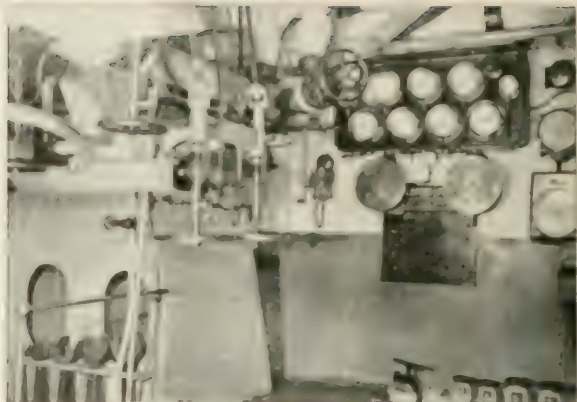
View looking down from the middle grating at the port side showing low pressure turbine and its first reduction gear.

National Geographic Magazine

Sperry Gyro Compass and Pilot

Safety Insurance

In this article we shall attempt to show that the Street 2000 will not have any



The second round of the winning team is the lower gating level of the engine worn during gear third. One engine (1994) requires constant heat temperature (10000 rpm) gear and one (1994) requires telephone.

Several features of a completely free market are. All individual positions, meanings, and settings are to remain dynamic. Variables must free move; constraints are removed, or loosened; interests, like most things of importance, become negotiable.

Inter-Tire detection and removal tire chisel systems are installed. The tire chisel provides free rotation grinding action and then remove detection system protect the engine from being run large components and fuel tanks.

THE MICHIGAN TURFGRASS COMPANY, 12500 E. 14th Avenue, Detroit, Michigan 48204, congratulates you on the beautiful new home you are building. May it be a source of pleasure and comfort for many years.

The two groups kept the same the game thing about in the Mardian environment but different the game played on E deck and the winning team on B deck.

ment, furnishings, and color schemes. Notable improvement in appearance is produced through the treatment of the formerly dark hardwood in pastel shades of enamel paint in such a way as to bring out in harmonious relief the attractive carving of the pilasters and paneling in the public rooms.

Simmons beds and Simmons Pullman berths insure sleeping comfort.



A bathroom interior typical of the rebuilt Maui Mariner, and Maui cleaning with nickel work and painted wood trim.

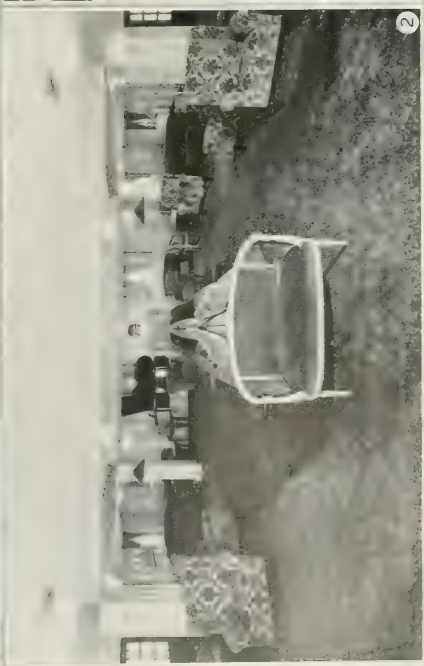
The bath rooms, as will be noted in the illustration herewith, are

ing that Pacific Coast shipyards are attacking boldly the problem of adapting modern plumbing to the needs of the results are very beautiful.

The Maui, Matsonia, and Manoa are now on a par, so far as comfort is concerned, with the Malolo or any other ship afloat.

The Matson Navigation Company intends to build three new passenger liners for the San Francisco-Australia run. Just when these will be laid down depends on federal cooperation.

Vessels of the character and speed needed for this work are national assets. In times of peace they form a great link in the chain of commercial communication. In the event of war they are an invaluable auxiliary to the Army and Navy. Federal aid therefore is wholly justifiable and should be readily available. Passage of the Wood bill or the White bill, would provide the aid needed.



[illegible][illegible]

A black and white photograph of a large, multi-decked ship, possibly a cargo or passenger vessel, docked at a pier. The ship has a prominent funnel and is surrounded by other smaller boats and structures in the background.

[illegible]

And, according to the literature, is provided by the Worthington and Pearson (1990) study. Worthington and Pearson (1990) found that the most common reason for the failure of the CFT was the lack of support. These authors state that the lack of support is the most common reason for the failure of the CFT.

packed with Ray individual blower burners. Three burners to each tube. The tubes are all 4 in. in diameter and 12 ft. long. The tubes are mounted on a Ray Crane metal frame. The condensers are Ray Crane metal tubes and are returned, and all tubes packed with John Crane metallic packing.

The power is produced by a Westinghouse 100,000-kw generator, which is driven by a gas turbine from a Sperry Corp. turbine. The entire generating equipment consists of storage batteries with automatic connection to a 240-volt direct-current bus for charging. The entire wiring system of the station is made up of heavy lead and armor cable. A new innovation in air duct installation for the generator turbines makes the entire unit a completely separate unit. The tubing in these condensers is packed with John Crane metallic packing.



The games of the U.S. Grant featuring Royal Rooking ranges.

Galleys

The main galley and troops galley are in the same compartment separated by an expanded metal partition. Both galleys are equipped with **Ray** oil burning ranges. The bake shop is adjacent to the main galley. It is equipped with nine **Westinghouse** electric ovens.

Accommodations

The layout of accommodations on a transport is a much different problem than that on a liner. The latter must provide many more or less superfluous luxuries to attract passengers and compete with similar ships. A liner is usually designed to carry passengers under a given set of conditions. A transport, however, does not have to compete for passengers. It is designed to carry officers, troops and families in comfort, and, in the event of emergency, must be immediately available to accommodate much greater numbers than peace-time duty demands. Transports must embody more utility and less luxury than liners to accomplish this requirement. In addition, a transport is certain to see service in time of war and must be constructed, as far as possible, of fire proof and splinter proof material to withstand shell fire. On the U. S. Grant the passenger accommodation space has been arranged with rooms of various sizes equipped with from two to eight beds or berths. The size and equipment of these rooms was determined by the average experience of the transport service between San Francisco and Manila.



Framing for standee bunks in the troops quarters. Note ventilating fans.

A number of staterooms on the U. S. Grant are equipped with the **Simmons** Pullman type folding berth, which gives the same sleeping comfort as a good Simmons bed, occupies in its folded position the minimum of stateroom space, and presents an attractive appearance which can be made to conform nicely to the finish of the stateroom bulkhead.

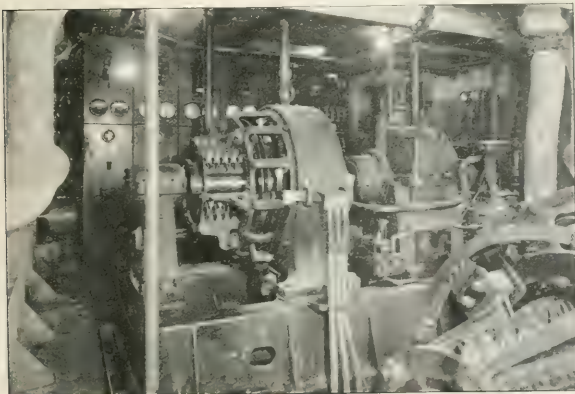
The maximum peace-time capacities provided on the Grant are:

First cabin passengers 350
Second cabin passengers	75
Troops 1000

In the event of war these figures could be increased by the installa-



A stateroom on the U. S. Grant with the original German berths in place. Note the curious life preserver locker at the base of the berths.

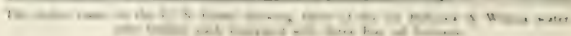


View on the dynamo flat of the transport U. S. Grant showing Westinghouse geared turbo-generators and the switchboard in the background.

tion of additional berths and standees without altering the present arrangement.

The boat deck, "C" deck, is devoted to ship's officers forward and the hospital aft. The large hospital provided is necessary in a transport, which must carry sick and wounded. This deck is largely of the original construction, being merely rearranged.

"B" deck is the promenade. The social hall occupies the forward part of the deck, the rest being given over to staterooms. These staterooms are all new. The rooms are divided by Plymetl bulkheads and sheathed with the same mate-



It is assumed that the observed

The application of copper oleate is very easily accomplished at no great cost and it has been generally adopted by all the larger fishing companies in the United States, especially in the warmer southern waters. Many manufacturers of fishing tackle and its preservative advantages are being generally recognized as very valuable.

Typical first-class stateroom as equipped on the Matson Navigation Company's liners *Miami*, *Matsonia* and *Manoa*. Simmons twin beds give first-class comfort. The Simmons Pullman berth on the bulkhead provides room, if required, for an extra member of the family. Pullman berths of this same type are fitted on the U. S. Army transport *U. S. Grant*.



Interesting Log Book on Motor Tanker

THE motorship San Pedro Maru is the only diesel driven tanker flying the Japanese flag. This tanker, of 10,500 tons dead weight, arrived in San Francisco early in February after seven months continuous operation.

This vessel is driven by a single 6-cylinder Sulzer diesel engine built by the Mitsubishi Company in Nagasaki, Japan. The engine operates at a service speed of 10½ knots, at 2100 shaft horsepower, and 101 revolutions per minute. The cylinder dimensions are 23 5/8-inch bore by 41¾-inch stroke.

N.S. SAN PEDRO MARU	525"	INV = 850"
Nº5	565"	SCAV. = 101"
	88.75"	REV = 101
	715	12/11/27

Fig. 1. Indicator card records as kept on Japanese motor tanker San Pedro Maru.

Of particular interest to operating engineers is the log kept by Chief Engineer C. Choji. A very accurate record is kept on indicator cards similar to the one shown in Fig. 1. Indicator cards include the regulation power card and the illustrative hand drawn card showing compression and combustion conditions. At the time indicator cards are taken, an exhaust gas indicator card, as illustrated in Fig. 2, is also made. This indicator is made on a piece of coarse white cloth which is placed over the exhaust test cock for ten firings of each cylinder. These exhaust gas indicators are recorded with their respective indicator cards and comparisons made. By comparative analysis, adjustments can be quickly determined to balance cylinder loading and produce efficient combustion in each cylinder.

The log also revealed an average fuel consumption of 0.418 pound per brake horsepower hour and a lubricating oil consumption for all purposes of 8 gallons a day.

The records of the turbo-blower revealed that a double-motored Brown-Boveri blower operated continuously on one motor throughout a 21-day trip. In most blowers it is customary to shift motors every week. For 14 days the motor absorbed 230 amperes at 220

volts. After two weeks the amperage increased to 250 without endangering the commutator.

The log also showed that unpurified fuel caused sparks to issue from the stack. By cleaning all of the fuel with a Sharples centrifuge, this sparking was eliminated.

A careful check-up of bearings, crossheads, guides, and cylinders showed no wear on the first three items and maximum wear on the cylinders was less than normal.

Lonely Cablemen

(Continued from Page 154)

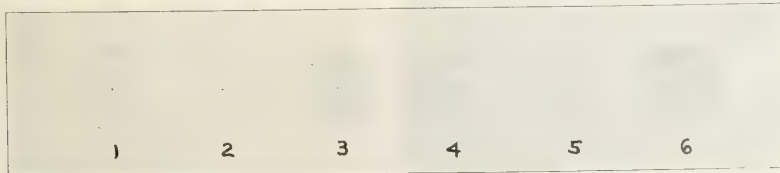
bulls with neatness and dispatch, to the wonder and delight of the natives.

In the early history of transoceanic communication most cablemen, as intimated, were British and nearly all passed through the training school at Porthcurnow, on the Cornish coast. With the increasing importance of the Western Union Telegraph Company in the cable world, however, a change has come about. Not only are there more Americans employed, but the policy of the company in equipping stations with automatic relay apparatus has speeded up service and changed the character of employment. The old-time cable operator transmitted messages by hand, the men at isolated stations relaying messages on a double key. Now the message is sent from a typewriter keyboard, and passes uninterruptedly through the outlying stations through the medium of automatic apparatus. Transmission from New York to London, or to Paris, for example, is instantaneous, and the cablemen at Bay Roberts, Hearts Content, Valencia, or the Azores are trained electricians who watch the automatic apparatus to make sure it is in perfect adjustment.

The Western Union also has established model colonies at all its cable stations. These colonies consist of the cable station proper, hospital, recreation rooms, library, tennis courts, bowling alleys, athletic fields, skating rink, dormitories, and separate houses for married employes and their families. The station proper consists of quarters for superintendent, traffic personnel, instrument rooms, battery and dynamo rooms, storerooms, and workshop.

Here and there you may find an old-timer who insists that the new regime has robbed the cableman's life of some of its romance, but all will agree that it also has taken away much of its hardship and ennui, while it unquestionably has added greatly to the efficiency of modern high-speed communication.

—Dots and Dashes.



Exhaust gas indicator card as taken on Japanese motor tanker San Pedro Maru.

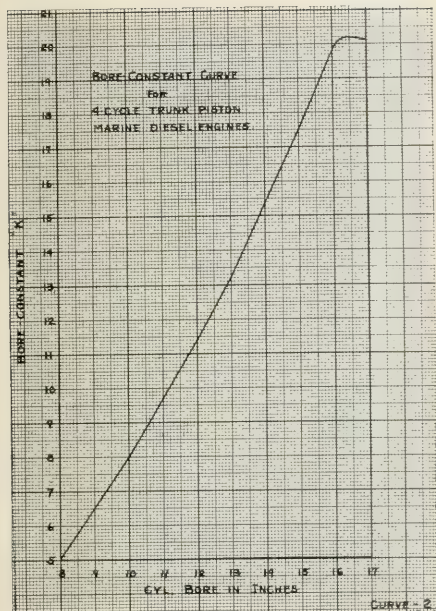
J. C. A. Rosemary

When using a compound hand-sawed for straight cuts on boards from 20 to 40 inches long, use a cut similar to the 4-in. 2-in. stroke given previously, except that the hand should be kept stiff and the arm straight. As a result of this vigorous, straight, downward motion, the saw should be guided on both ends and stroke should follow a fairly definite



For the purpose of deriving a meaningful fuel economy rating, this rating formula is devised for 4-cycle trunk injection engines based around a base condition of a 600-horsepower system or the high pressure common rail solid injection fuel system.

But $A = \frac{3.1416 D^2}{4}$ where $D = \text{Bore of Cylinder}$



Substituting this in Formula 2

$$\text{B.H.P.} = \frac{\text{CEPS } 3.1416 D^2}{4 \times 4 \times 33000} \quad \text{or}$$

$$\text{B.H.P.} = \frac{\text{CEPSD}^2 \times 3.1416}{4 \times 4 \times 33000}$$

Formula 3

$$\text{Let } \frac{\text{EPD}^2}{1000} = K = \text{Bore Constant}$$

Substituting in Formula 3 and solving the equation:
B.H.P. = CSK (0.00595) or in simpler form:

$$\text{B.H.P.} = .006 \text{ CSK} \quad \text{Formula 4}$$

where: C = Number of Cylinders
S = Stroke factor from Curve 1.
K = Bore constant from Curve 2.

Conclusions

Curve 1 is in reality a piston speed curve for average conditions. This does not mean that every engine should follow this curve for its rated piston speed, but shows an average piston speed condition existing under average mean effective pressure conditions. In any engine properly loaded, the product of the piston speed and mean effective pressure is approximately constant. In general, then, as the piston speed is increased the mean effective pressure is decreased at full load rating or vice versa. Curve 1 is, therefore, called a Stroke Factor Curve of average piston speeds when referred to average bore constants represented in Curve 2.

Curve 2 indicates values of the bore constant K for cylinder bores from 8 inches to 17 inches in diameter.

These constants have been determined by applying actual values to the equation

EPD:

— as indicated following Formula 3.
1000

It will be noted that the curve takes a decided bend between 16-inch and 17-inch cylinder diameters. In these diameters the limiting size of uncooled piston is approached. Above 17 inches it is customary to water-cool pistons; hence the reduced values of K on approaching 17-inch cylinder bore. Curve 2 is, therefore, called a Bore Constant Curve of average relative cylinder load conditions.

Following is an example of the application of this formula to a standard marine diesel engine:

Name Plate Reading = 400 B.H.P. at 225 R.P.M.

Bore = 13½ inches

Stroke = 20½ inches

Number of Cylinders = 6

B.H.P. = 0.006 CSK

From Curve 1, S = 779 for 20½-inch stroke

From Curve 2, K = 14.25 for 13½-inch bore

B.H.P. = 0.006 x 6 x 779 x 14.25

B.H.P. = 399.63 or 400 B.H.P.

The actual piston speed of this engine is 769 feet per minute to suit the best propeller conditions; but the cylinder load is exactly suited to this speed so that on a standardized rating the engine is capable of developing 400 brake horsepower.

Parallel curves can be drawn below the Bore Constant Curve 2 to represent values of "K" for other types of solid injection engines in the order previously listed in this article.

The intention of the formula is to aid the purchaser and not to put limitations on manufacturers who are constantly advancing their products to obtain increased ratings based on proved operating results.



An artist's conception of the new Hamburg-American Line motor-ship Seattle as she will appear leaving Hamburg for the Pacific Coast on her first voyage.

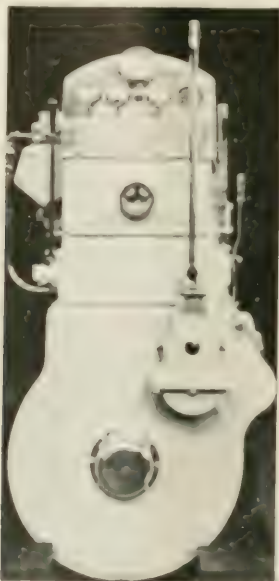
New Type Winton Diesel Engine

Airless Injection, 4-Cycle, Fully Reversible, Marine Propulsion Unit of Light Weight, Rugged Strength, Compact Design, Pleasing Appearance and Remarkable Performance

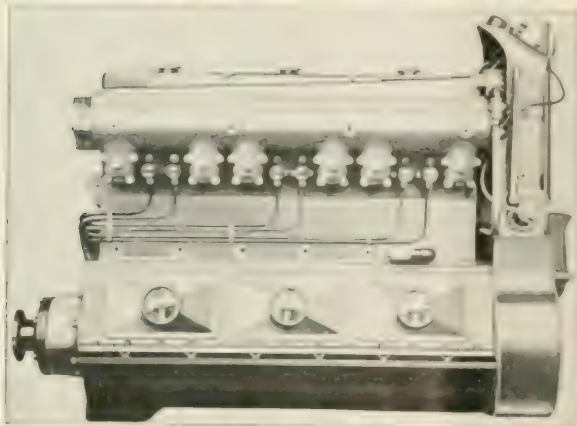
THE Winton Diesel Engine, the latest development in the design of airless injection diesel engines, is a fine example of modern marine propulsion design. It is a 4-cycle, 4-stroke engine, with a compact, rugged design. The engine is designed for use in a wide range of applications, from small boats to large ships. It is a fully reversible engine, and it is designed for long life and low maintenance.

The new type Winton diesel has a compact, rugged design, and it is designed for long life and low maintenance. It is a fully reversible engine, and it is designed for long life and low maintenance. The engine is designed for use in a wide range of applications, from small boats to large ships. It is a fully reversible engine, and it is designed for long life and low maintenance.

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Front view of the new type Winton diesel. 1700 cubic displacement, 10000 and 12000 h.p. units.



Starboard side of Winton marine diesel.

limited load, reversible, compact, strong, durable, and easy to maintain.

All components are built to the highest standards of quality, and the engine is designed for long life and low maintenance. It is a fully reversible engine, and it is designed for long life and low maintenance.

The new type Winton diesel has a compact, rugged design, and it is designed for long life and low maintenance. It is a fully reversible engine, and it is designed for long life and low maintenance. The engine is designed for use in a wide range of applications, from small boats to large ships. It is a fully reversible engine, and it is designed for long life and low maintenance.

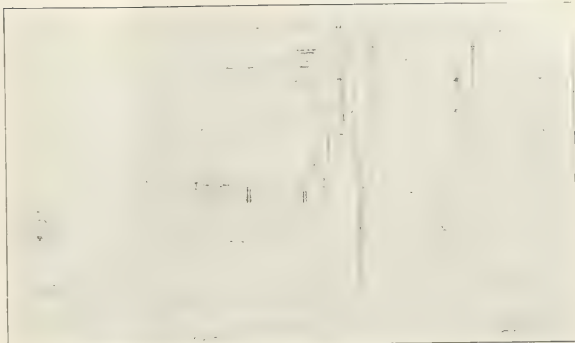
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All models are supplied in port and starboard rotation; also for both medium duty and high speed service. Equipment includes air bottles, instrument board and gauges, service fuel pump, and set of tools.

Fully equipped, the weight of Model 138, a 6-cylinder unit developing 200-horsepower at 700 revolutions per minute, is 7400 pounds.

One engine of the Winton Model 138 marine type has recently been sold to Frank W. Davey of Hollywood, California, by Frank Bryant, Pacific Coast representative of the Winton Engine Company. This engine is for installation in the fine new 80-foot cruising yacht now building for Mr. Davey at the boat building yard of Harbor Boat Works, Terminal Island, San Pedro, California, from design by Collis and Baer of Los Angeles.

The Winton Engine Company has recently been awarded the contract for the diesel-electric propulsion machinery for the three new lightships to be built for the United States Lighthouse Service by the Albina Marine Iron Works of Portland, Oregon. This order involves a total of twelve 112-horsepower, 4-cylinder diesel engines, each direct-connected to a General Elec-



Side and end elevations of new type Winton marine diesel.

tric generator and three 400-horsepower General Electric motors.

steam plant. Starting with a 270-horsepower Washington-Estep diesel engine, this company has called for increased strength until now 335 horsepower is found too small and a 500-horsepower unit will soon be built.

To the marine engineer who associates steady turning of an engine with power and efficiency, the sudden shifts of power from idling to hundreds of horsepower look odd. It seems as if that sort of thing would wreck an engine of the internal combustion type. But the Washington-Estep engine stays on the job adjusting herself to the conditions and producing results.

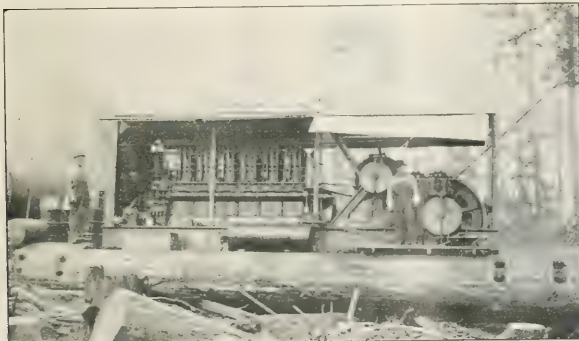
A Sea Diesel at Home in the Forest

A workboat diesel engine up in the forests of Washington would seem a queer thing. But mounted on a massive skid base a Washington-Estep 335-horsepower marine diesel engine is pulling big logs from where they have been trimmed and cut by the lumberjacks to a central point for shipment in train loads. To haul a big green log twenty-four feet in circumference and ninety feet long through a forest takes power. But the diesel does the trick. At times the steel hawsers, 1 5/8 inch diameter, of the finest material, break under the terrific strain, but the

sturdy diesel keeps right on rolling over, her exhausts a bit more sharp and eating a larger ration of fuel.

The illustration shows a Washington-Estep 335-brake horsepower engine at work on the job. By a system of booms, derricks, leads and guys, the long steel cables are led far away from the central point, distances of thousands of yards, and when all the logs are in, the big engine on its skid, pulls itself to another point and the work goes on.

The Long-Bell Lumber Company has tried out the diesel on this work and prefers it to the older



Logging skid, equipped with 335-horsepower Washington-Estep marine type diesel engine, hauling out logs for the Long-Bell Lumber Company in the forests of Washington.

Trade Literature

Linde Air Products Co., 30 East 42nd Street, New York, has published an attractive 26-page booklet entitled "Welded Piping—The Modern Better Way for Installing Plumbing and Heating Systems." This booklet contains many interesting photographs, much valuable information, and numerous accounts of experiences and observations relating to welding and its varied applications.

International Nickel Co., 67 Wall Street, New York, has available for distribution the 19-page "Monel Metal and Pure Nickel Products Buyers' Guide, Fall 1927."

Michigan Wheel Company, Grand Rapids, Michigan, has ready for distribution a catalog on Propellers, Marine Hardware, and Boat Supplies. This little catalog is of handy size and contains illustrations, specifications, and prices.

any individual head may be removed without disturbing the header. This rigidity and ruggedness add to the engine's neat appearance. A machine with strength and without projections and sudden changes in line is always pleasing to the eye.

Fuel System

The injection system is really quite a variation from common practice, and the change seems to have been justified. Inspection of piston tops after more than a year's operation on an industrial load, and the same after the usual 100-hour marine auxiliary test, shows the original tool marks as plainly as do new pistons. At no time yet have rings shown the slightest signs of sticking, and under 80 pounds brake mean effective pressure the exhaust is colorless. These conditions, together with the fact that the engine will start on the first revolution on 400 pounds compression when the cylinder block is considerably below freezing temperature, indicate that combustion conditions are almost perfect.

Fuel is delivered first to the filters on the front of the engine, then to the injection pumps. These filters are made from very fine mesh monel metal cloth and are arranged so that the feed can be changed from one filter to the other without interfering with operation. The fuel pump itself is not greatly changed from the original M.A.N. except in detail. These details were changed more for the purpose of making it a better manufacturing proposition than anything else and did not alter the principle of the pump. This pump has two discharge valves, the second of which is heavily spring loaded. Since fuel oil is slightly compressible, a very small part of the stroke of the main plunger is used in building up quite a pressure, so that the fuel is under this pressure before it starts through the lines leading to the nozzles. It then, due to the increased velocity of the plunger, builds up a still higher pressure (6000 pounds by actual measurements), which is very suddenly released and reduced to atmosphere by a quick opening balanced by-pass. This point of cut-off is of course controlled by the governor.

The timing of the injection may be varied while the engine is running and is done by rolling the fuel pump roller around its cam. This adjustment is made from outside the cam case. There is no clearance between this roller and its cam, it being always in contact.



One of the three 3-cylinder, 150-horsepower Cooper-M.A.N. diesel engines on the Standard Oil tanker J. A. Moffett.

There are two horizontal nozzles to each cylinder, each containing but two jets. Neither of these nozzles has check valves or other moving parts, they being unnecessary with this construction of fuel pump. These nozzles are not opposed, but their jets are directed tangent to an imaginary circle in the center of the combustion space; and since the combustion space is perfectly round and symmetrical, a whirling motion is produced which tends to a more intimate mixture and better combustion.

There is also another very important advantage to this type of injection when it is analyzed. The distance which a jet will penetrate depends not only upon the pressure and wall thickness but also upon the hole diameter, the penetration being almost proportional to the diameter. Therefore, since with this method of injection the distance to be penetrated is practically twice that of center injection, the holes can be proportionately larger, which almost entirely frees them of clogging with dirt and carbon.

The by-pass operating shaft is connected to the governor through a coiled spring, and carries a hand lever on its opposite end, so that

the engine may be controlled by hand independently of the governor if desired. The end of this hand lever is pointed and indicates on a graduated scale the percentage load on the engine at all times. It is graduated from zero to 150 percent. The governor is unusually sensitive, and gives very close speed regulation. Starting and stopping may be done either from the upper or lower grating, depending on the arrangement desired. Provision is made for heating all fuel filters, pumps, and pipes by jacket water or steam, if it is desired to burn viscous fuels.

Lubrication

Lubrication of all bearings and contacts is by pressure feed, there being no hand oiling on the engine. Lubrication of the pistons is by splash only.

Trade Literature

The Rix Company, Inc., manufacturers of compressed air machinery, with Pacific Coast offices at San Francisco, Los Angeles, and Seattle, has issued a temporary bulletin covering the Model DF diesel engine starters, which will be mailed on request.

[illegible]
$$\frac{1}{2} \left(\frac{1}{1} + \frac{1}{2} \right) = \frac{3}{4} \quad \text{Sum} = \frac{1}{2} + \frac{1}{4} = \frac{3}{4} \quad \text{Product} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \quad \text{Reciprocal} = \frac{1}{\frac{1}{2}} = 2$$

Efficient to find the names of the persons who will vote on the case. Compare that to the names of the 12th and 13th 2000 generations to get the names of the 12th and 13th 1000 generations. The last names of the 12th and 13th 1000 generations are the same as the 12th and 13th 1000 generations.

Each year, several thousand people are hospitalized because of influenza. The influenza epidemic of 1968 was the first time with pandemic potential, and some 100,000 people are estimated to have died in the United States. The disease is caused by a group of viruses known as influenza, which are transmitted from person to person, and is characterized by a sudden onset of fever, chills, muscle aches, and a sore throat. The disease is usually self-limiting, and most people recover within a few days. However, in some cases, the disease can lead to complications, such as pneumonia, and even death. The Centers for Disease Control and Prevention (CDC) recommend that all people aged 65 and older, as well as people with certain chronic conditions, get an annual influenza vaccine. The vaccine is made from inactivated virus, and is safe and effective. It is available at many health care facilities, and can be given as a shot or as a nasal spray. The CDC also recommend that people get the vaccine every year, as the influenza virus changes over time.

[illegible]

Table 1. Summary of the study.



Above is shown the yacht Savannah, largest and most powerful diesel yacht yet built in America. She is equipped with two 4,500-horsepower Bessmer straight-eight diesels.

At the right is shown a portion of the Bessmer Gas Engine Company's machine shop at Grove City, Pennsylvania.



great flexibility in maneuvering. The units are of comparatively light weight. The design allows easy accessibility to all parts subject to wear or needing adjustment. Its compactness and vibrationless running combine to make this unit a very desirable prime mover for yachts. These characteristics were recognized by the owner, naval architect, and builder of the recently completed yacht Savarona, the largest diesel yacht yet built in America. This vessel was equipped with two 1500-horsepower Bessemer straight eights, which are giving a very good account of themselves.

We illustrate herewith the Bessemer Gas Engine Company's plant at Grove City. This factory has a floor area of 458,272 square feet and is thoroughly up-to-date in layout and equipment. The Bessemer foundry is one of the largest



View of the erecting bay in the machine shop of the Bessemer Gas Engine Company's plant, Grove City, Pennsylvania.

industrial foundries in the world and is equipped with all of the most efficient foundry machines known to modern practice.

Piston Pin Fractures in a Diesel Engine

ON A diesel-electric vessel plying along the Pacific Coast, an interesting condition developed after the engines had been in operation a little over two years. Without warning one of the piston pins gave way and shortly after, another followed suit. The ship was equipped with two 6-cylinder trunk piston, air injection diesel engines of 13 3/4-inch cylinder bore, direct-connected to generators. Anxiety was naturally manifested regarding the piston pins of the remaining ten cylinders.

The fracture of each pin had occurred at the small 4 5/8-inch diameter recess turned on one end of the pin to permit grinding of the small fit as illustrated in Fig. 1. Upon investigation of the fracture, no

flaws in the material were detected, the steel was of 20 point carbon and had apparently been properly carbonized-hardened. The two end fits appeared to have had good contact in the piston. The bosses in the piston, however, were not very long and not very rugged.

The stresses exerted upon the piston pin were then calculated and analyzed. The gas pressure exerted a force "F" (Fig. 1) of 36.2 tons on the connecting rod bearing surface. This force created a bending moment and a twisting moment "T" on the pin fibers. These two combined moments stressed the material in the pin to over 9000 pounds per square inch. Under this type of service it was reasonable to stress the material of the quality used in

the fractured pins to about 7000 pounds per square inch. The material, however, had been stressed much higher so that an alloy steel of higher tensile qualities was found necessary. The steel selected for the new piston pins was SAE-2320, containing 3 per cent nickel and 20 point carbon. This material, when carbonized-hardened for best wearing qualities and toughness, would permit an allowable working stress of 10,000 pounds per square inch.

The new piston pins after three years satisfactory service have apparently proved that the original pins were too highly stressed for continuous operation.

Trade Literature

The American Metal Hose Co., Waterbury, Connecticut, manufacturers of flexible metal hose, flexible metal tubing, and flexible metal conduit, has a handy pocket size catalog which they will be glad to send to any one interested. This catalog explains exactly what is flexible metal hose; is well illustrated with photographs of various types of products supplied; and contains tables giving sizes and other details for use in making up specifications.

Standard Gas Engine Co., Oakland, California, has recently published Bulletin No. 28, which Gerald Brusher, general manager, claims is the last word in brevity and compactness in supplying information. This gives the full specifications and particulars of the "Frisco Standard" engine for marine and stationary use.

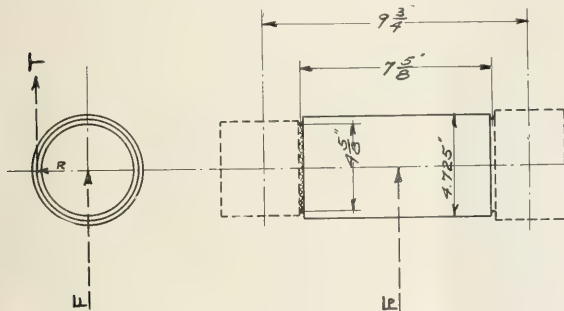


Fig. 1. Drawing illustrating the fracture of piston pin in diesel engine.

Pacific Workboats and Their Power Plants

Old Time Boatbuilding Record

THE late George W. Kneass, who, according to the general opinion of Paul M. Kneass, Jr., his son, was the best boatbuilder in the Pacific Coast, is the subject of the first chapter of the book "Old Time Boatbuilding Record," which is the first of a series of three books on the subject. The book is written by George W. Kneass, Jr., who is the son of the late George W. Kneass, Jr. The book is written in a simple, straightforward style, and is a valuable addition to the literature of the Pacific Coast. The book is written by George W. Kneass, Jr., who is the son of the late George W. Kneass, Jr. The book is written in a simple, straightforward style, and is a valuable addition to the literature of the Pacific Coast.

And "Johnny" could build them quickly, too, in any old place. As he sat on the water, he saw some of the boats that had been built in the Kneass yard and had been sold. The boats had been sold to a number of different places. (All of them, he believed, in full day or two, then.) Sunday was Johnny's day to go to work, and he went to a stroll along the waterfront to look at the latest types of ships and boats. Having his own boat, he was in the yard for the week the six new boats had been built. The captain, looking down at the workmanship, said he decided to go to the yard for the week the vessel was to sail for the North on the Tuesday following, it would be impossible to get it done.

Johnny, however, said he was afraid of the boat to get done. He said that the boat was not out in anything like that. "You just give me the time, and we'll have the boat ready in time," he told the captain.

The next day, however, he hot-footed it back to the yard with the boat to get it done. The boat was not out in anything like that. "You just give me the time, and we'll have the boat ready in time," he told the captain. The next day, however, he hot-footed it back to the yard with the boat to get it done. The boat was not out in anything like that. "You just give me the time, and we'll have the boat ready in time," he told the captain.

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The Super Elto Quad

THE Super Elto Quad, made in the United States, is a small, fast, and powerful outboard motor. It is a valuable addition to the literature of the Pacific Coast. The book is written by George W. Kneass, Jr., who is the son of the late George W. Kneass, Jr. The book is written in a simple, straightforward style, and is a valuable addition to the literature of the Pacific Coast.

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The Super Elto Quad in action.

Mullins Metal Boats

THE use of aluminum and Armco metals in construction of small boats has become an outstanding feature with the Mullins Manufacturing Corporation of Salem, Ohio. These materials are ideal for this class of craft, and the use of modern construction methods reduces cost of manufacture to the advantage of the purchaser.

These boats are pressed into shape from special sheets with such distribution of material that lightness is gained with no loss of strength. The result is attractive appearance and seaworthiness. A high finish of Duco in different shades adds beauty. These small

craft can be operated with oar or by sail, and are especially adapted for outboard motors.

Weeks-Howe-Emerson Company of San Francisco is now distributor of these boats, and has a specially fitted up show room loft, 60 by 100 feet, where the various models are on exhibition. On many of these craft, Caille outboard motors are installed in horsepower from 3 to 10, the latter weighing only 60 pounds.

There is a big demand for these small craft. Some of the larger types of Mullins boats are serviceable for outside work and are fitted with protective cabins, making them near cruisers.

A Marine Glue that Stays Put

WOODEN decks and side planking leak unless they are well caulked and a water-proof compound is paved over the caulking. Pitch of various kinds has long been used for this purpose. In biblical stories we are told that Noah used pitch in making the Ark water-tight.

Less than a century ago a man named Alfred Jeffreys, an English ship worker, evolved a compound which he believed would be better than the pitches then in use. His mixture was called Jeffrey's Marine Glue and, made according to

the original formula, it is still standard material for many purposes afloat. In addition to its water-repelling quality, it is to a degree elastic and gives a bit with the motion of the deck, either from stress or expansion and contraction. Jeffrey's Marine Glue will not crack, even in the most extreme cold weather. It never becomes sticky from tropical heat, and in many instances in seams close to the portion of hulls destroyed by fire at sea, the Jeffrey's Marine Glue payed on to the top of the caulking material has remained in-

tact and preserved the oakum underneath.

Old canoes and small pleasure craft can be made practically new by simple applications of Jeffrey's marine glue, according to directions published by the manufacturers. This glue, as well as fillers and putties, made by the L. W. Ferdinand Company of Boston, is sold by ship chandlers the world over. The C. J. Hendry Co., of San Francisco, is distributor for California.

A New Generating Set

FAIRBANKS, MORSE & CO. has recently placed on the market a small gasoline-engine driven electric generating set designed to hold up under hard service. This machine, owing to its compactness and reliability, is especially adapted for marine auxiliary power or for lighting units on sailing vessels, workboats, or fishing craft.

The unit is built for 32-volt service in capacities of either 750 or 1500 watts. The only moving part exposed is a power pulley, and this can easily be eliminated if undesirable. Lubrication is by the pressure system, and either gasoline or kerosene can be used as fuel. All parts are interchangeable. The electric generators and controls set new standards as regards finish and strength, giving a close voltage delivery under changing loads without flickering. These new units can be seen at the warehouse of the company in San Francisco operating either with or without batteries.

A Service Stripe

TWENTY-THREE years ago a fisherman operating out of Port Townsend, Washington, had installed in his boat a 12-horsepower Hicks gas engine. A few weeks ago the fisherman, now well along in years, went into the store of the Pacific Marine Supply Company of Seattle to replace an accidentally broken part connected with the valve operating gear of his engine. He at the time mentioned that it was the first cent he had spent on repairs on that engine in all those years of service. "And the little 'ingin' runs well yet," he added as he left with the new piece.



The Electra, a modern seiner of the Puget Sound type, built by the Olson & Sunde Machine Works, Seattle. She is 72 feet long, 17 feet 6 inches beam, and 9 feet depth. Her Washington-Estep 135-horsepower marine diesel engine drives her handily at 10-knots speed.

Workboat Notes

The design of the **Ally Imperial Engine Company** is continuing work on a new design, featuring a new type of fuel injection system. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

The **Motor** engine is being built for the **Ally Imperial Engine Company** by **E. L. Fulton** in the company's new design. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

The **Union Gas Engine Company** is building a new design for the company's new design. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

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Anderson & Cristofani at **Hunters Point, San Francisco**, have several jobs in hand. Among them is a fishing craft for **Captain Bert Fontana** of **Monterey**, which will be fitted with a light type 20-horsepower **Alford** engine. Another new design, 18 feet length, has been started for **Captain Bruno** of **Monterey**, which will be powered with a 30-horsepower **Standard** gas engine.

One new cruiser is nearing completion at the shipyard of **W. F.**

Steele & Co., General Shipbuilding at **San Francisco**, have several jobs in hand. Among them is a fishing craft for **Captain Bert Fontana** of **Monterey**, which will be fitted with a light type 20-horsepower **Alford** engine. Another new design, 18 feet length, has been started for **Captain Bruno** of **Monterey**, which will be powered with a 30-horsepower **Standard** gas engine.

M. W. C. & Son's yard, **San Francisco**, is building a new design for the company's new design. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

The **Standard Gas Engine Company** shops at **Oakland** have been busy for some time. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

Bagley & Nunes of **Oakland** are little new work, but their yard has been fairly busy on general repairs of fishing and workboats, the ways being occupied most of the time.

Captain P. Stanbourg, well known master mariner of the **Pacific Coast**, is having rebuilt at **Anderson & Cristofani's** yard, **San Francisco**, something new for the fishing industry of the **Pacific**. It is an **Otter trawler**, a type invented in **England** by a fisherman named **Otter**. It is peculiar inasmuch that all the lines can be handled by one

person, by means of a motor-driven winch.

The **Otter** is a new type of fishing boat, built for the **Otter** fishing boat. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

The new **Otter** is being built for the **Otter** fishing boat. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

Pabco Multi-Service Paint

CHERRY is the **Pabco** Multi-Service Paint. It is a new type of painting material, built for the **Pabco** Multi-Service Paint. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

To The Paraffine Companies, Inc., of **San Francisco**, the **Pabco** Multi-Service Paint is a new type of painting material, built for the **Pabco** Multi-Service Paint. The new design is being installed in the engine which has been built for the company's new design. The new design is being installed in the engine which has been built for the company's new design.

Before Multi-Service paint was made available for the consumer, tests were made with paint in **San Francisco** and in many foreign countries under varying conditions. A close watch was maintained by company officials on the probable effect of the elements on the paint and it was found that it withstood the action of the elements even better than more expensive paints of the old type.

Trend in Marine Engineering

By W. B. Bassett, Propulsion Section Head,
Westinghouse Electric and Manufacturing Company.

ALTHOUGH the number and total tonnage of new vessels ordered during the twelve months ending March 31, 1928, have fallen below the figures of the preceding year, the application of electricity on board ship has materially increased. An analysis of marine engineering developments during this period clearly indicates that the economies realized through the use of electrified equipment are being recognized by the owners and operators of vessels of all classes.

This statement is supported by the contracts awarded during the last twelve months for the modernization of old vessels. Almost without exception the auxiliary machinery of these ships has been partly or wholly electrified, even in steam propelled vessels, while three large freighters will have their steam propulsion machinery replaced by electric drive.

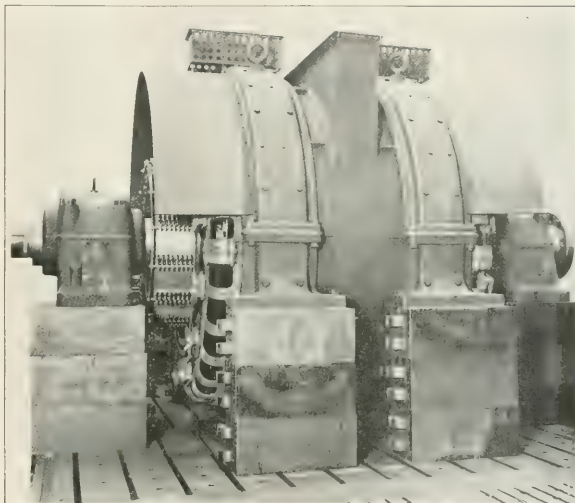
This increasing preference of the marine industry for electrical apparatus can be best illustrated by the following review of Westinghouse installations awarded during the company's past fiscal year which ended March 31. This review includes new vessels and those reconditioned or converted, grouped according to the type of installation.

Diesel-Electric

One of the most important types of diesel-electric installations is the equipment of the three large Shipping Board freighters *Triumph*, *Defiance*, and *Courageous*. The original 3000 shaft horsepower steam propulsion machinery and steam-driven auxiliaries of these vessels will be replaced by diesel-electric propelling equipment of 4000 shaft horsepower and completely electrified auxiliaries.

This type of propulsion was selected after careful analysis of conditions to be met and results accomplished which involved an increase in speed from $10\frac{1}{2}$ to more than 13 knots and the utilization of a high efficiency low speed propeller. The complete electrical equipment of the *Triumph* and *Defiance* will be supplied by Westinghouse.

Of almost equal importance is



Westinghouse double-armature, 3200 shaft horsepower propulsion motor for Standard oil tanker.

the diesel-electric installation of 3200 shaft horsepower with electric auxiliaries for a large tanker to be built for the Standard Oil Company of California. This will be the highest powered diesel-electric tanker in the world. The economy of operation of the port load justifies this installation in which power for the cargo pumps is taken from one of the main generators, thereby eliminating the usual auxiliary power set. Reliability in service also strongly influenced the owners in selecting this type of installation.

Other Westinghouse installations of this type of propulsion include a ferry for the Florida Ferry Company; the auxiliary schooner yacht *Guinevere*, a river towboat for the Standard Unit Navigation Company of St. Louis, two U.S. Navy submarines, V-5 and V-6, and a 950 shaft horsepower ferry for the Golden Gate Ferry Company of San Francisco.

In connection with the last men-

tioned ferry, it is interesting to note that this is the seventh diesel-electric ferry that has been built for the Golden Gate Company and the fourth to be equipped by Westinghouse in a year's time. The reliability and ease of control of diesel-electric drive, together with the immense saving of time lost through overhaul and repair, are strong factors in the rapidly growing popularity of this type of propulsion for ferries.

The Westinghouse Company, which has pioneered in diesel-electric propulsion, has received nine of a total of fourteen contracts for installations of this type awarded throughout the world during the past twelve months.

Turbine Electric

Two turbine electric installations involving engineering innovations were contracted for during the past year. These are for two large cutters for the United States Coast Guard and are of 3000 shaft horsepower each. The propulsion mo-

Unpublished Manuscript

Electrical Auxiliary

Among the outstanding auxiliary installations are the Sun Oil Company's new tanker Sunoil and the New York and the Mill Street. The Company's reconditioned passenger vessel Havana. Another auxiliary

[illegible]

PROFESSOR J. H. VAN DER WERF, who has been appointed to the Chair of Law, is a native of the Netherlands.

First, the main engine bed plate, with its crank and eccentric pit pans, was made tight by caiking and cementing. The drip from oiling as well as the used oil is thence in that space. This is drained by a small pump, and the dirty oil, with some water, is lifted to a 200 gallon tank, fitted with a small heating coil, where the mixture is settled, the heavier water and much of the filth draining off. The remainder is transferred to another tank, which is also steam heated. Here the partly cleaned oil is allowed to further settle, and is then pumped to a third tank a few feet higher, from which it flows by gravity to a De Laval separator, where it is cleaned and brought back to original condition ready to be again used on the engines. A sample of the

The arrangement is inexpensive, most of the work of installation and installation being done from the engine room. From the intake air passages to the engine, all of the piping and valves were constructed from steel pipe. The pressure was 100 lb. per sq. in. The 100 lb. pipe was used for the 190 Type, which is of the 190 Type.

To Mr. Mills and the engineering men of the Ohioan much credit is due. In the arrangement and installation a small rotary pump was built on board and is operated by a belt from the grinder stand. This pump handles the oil from the settling tanks in a most satisfactory way.

The Oertz Streamline Rudder Corporation of New York has announced that during the month of January orders for Oertz rudders were received for twenty-one ships of a total deadweight tonnage of 78,000. This brings the number of ships equipped with this type of propeller to 265, with an aggregate deadweight tonnage of 1,364,000, all of which has been booked within three years.

Electric Fire Place Heaters

ELECTRICITY—the silent servant of man—has during the past few years taken a very large place on board merchant shipping. That is but fitting, since a merchant vessel, the steamer Columbia, built at Chester, Pennsylvania, for the Oregon Railway and Navigation Company, demonstrated to a then skeptical world the first commercial installation of the incandescent lamp and the parallel circuit. The dynamos of this plant were started on the second of May, 1880, and the world was started on a new phase in the supply and distribution of light and power.

Today electricity afloat as well as ashore has invaded every department of activity and is filling the modern demand for safety, convenience, and efficiency. On the up-to-date modern liner, electricity lights the ship, cooks the meals, washes the dishes, lowers the boats, handles the baggage, runs the elevators, circulates fresh air for ventilation, circulates ice water for drinking, manufactures cold for refrigeration, circulates fresh and salt water for baths, curls milady's hair and trims milord's whiskers, runs the laundry and the gymnasium, and does any or all of a thousand and one functions for the comfort and convenience of passengers and crew.

Electrical generators operated by either diesel engines or the improved types of steam turbines supply electrical energy at very low cost, particularly with the large and diversified uses giving a high load factor. With practically all passenger liners built in recent years, a part or all of the heating has been given over to electrical energy. This is especially true, of course, with those vessels using turbo-electric or diesel propulsion machinery.

Electric heating has many advantages. First, it is clean. There are no soot or ashes, grease or dirt requiring constant attention for their removal. Second, it is healthful. There are no noxious gases generated and no vitiation of the oxygen in the air content of the room being heated. Third, it is economical. There is no wasteful escape of a large proportion of the heated air up the vent, because there is no need of a vent. Fourth, it is easy of maintenance. There is no burning out of grates or refractories and with ordinary care,



Attractive interior featuring the fireplace, fitted with electric heater, in the smoking room of the reconditioned liner Maui of the Matson Navigation Company.

a good electric heater is practically everlasting. Fifth, it is convenient. There is constant uniform heat without attendance.

With all these advantages, there is the additional feature of easy adaptability to any interior decoration scheme. On this latter point much good work has been done by the designers of the Edison Electric Appliance Company as shown by the illustration which features an installation recently made for the firm for the Matson

Navigation Company of San Francisco. The unit shown is an Edison Hot Point fireplace type heater and it certainly fits into its surrounding very nicely. With the use of this type of heater, the traveler may enjoy all the cheery glow and warmth of the fireplace at sea as well as at home, and may revel in this enjoyment with no thought of fuel to be carried in, ashes to be carried out, and no worry over possible sparks or back draft injuring costly rugs or fine furniture.

Conveyor System a Success

THE Mathews conveyors installed on the Los Angeles Steamship Company's steamer City of Honolulu, as described and illustrated in Pacific Marine Review for August 1927, have proven a pronounced success. Recently a Pacific Marine Review representative had an opportunity to observe their operation in company with S. Lindo, marine superintendent of the line.

The reconstruction of the vessel made it necessary to arrange for a system whereby deck hoists could be done away with in No. 3 and No. 6 holds, as these can only be reached from the side ports. Four Mathews conveyors were ordered, and the Los Angeles Shipbuilding & Drydock Corporation's drafting

room designed and its shops built the operating gear to handle these conveyors. There are two at each hold, one to the 'tween deck and another to the lower hold. Both are so arranged that they can be operated at any desired speed by a 5-horsepower Westinghouse direct current motor, which can be reversed or stopped at will.

The motor and its reducing gears, which in turn drive the main shaft, are enclosed in an oil-tight and dust-proof cast iron box which also acts as the support of the upper and fixed end of the conveyor apron. All bearings are roller, and the connection to the main shaft is through a flexible coupling, insuring perfect alignment of the mechanism at all times. The case be-

The important elements of the lesson consisted with introducing all the items to the attending child, explaining the purpose of the medicine, which is all done in a pretty good manner, and finally, as there are few very small parts, pointed to the correct ones.

[illegible]

There are many ways to get the most out of your car. You can get the most out of your car by getting the most out of your car. You can get the most out of your car by getting the most out of your car.

Confronted with the question of how a company achieves, in a general sense, its long-standing, ongoing goals for sustained growth, using what might be termed "strategies for the future," Richard H. Schonberger, in the *Harvard Business Review*, of the August 1980 issue, has summarized some of the business philosophies and the understanding by generalists of the most successful American, Japanese, and European companies. He has also noted that the management of the largest U.S. corporations (in terms of sales) are among the most successful.

Reviews of *Indians* have also collectively "confronted with them new facts in comparison with other models." This very contradictory "spirit of Mr. Lusk shows that the Marquis's mission is well going, but that Indian knowledge requires

Eliminating Turbulence Saves Tubes

EXPLOSIVE charges that killed 10 people last March 1941, in the first case of spontaneous combustion caused by mercury. It was also the first demonstration that such a fire, confined to the liquid, did not burn. Since then, the possibility of spontaneous combustion of the metal in the pure form appeared. It was believed that, if the entering water could be made to flow in a thin film, the surface, heated by the flame with ground and covered tubes would be done away with.

The components of the A-1000 Marine Condenser Kit include a 6-in. diameter, 6-ft. length of 6-in. Venturi tube placed in the inlet end of each condenser tube. Its entrance end is flared to the right curve, and the diameter slightly narrowed in the length, with a correct expanding channel. These Flowrites are a snug fit in the inside of the condenser tube proper. The kit comes in two close sizes, and in the work of installation in old condensers the inner diameter of the tube is reamed slightly, the Flowrite painted on its outside with asphalt varnish and pushed into the tube.

Only the inlet ends are treated, as if RAs had found that no trouble comes from the discharges.

with a low-melting, orange-red solid that was soluble in benzene.

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Ventilated Piston Rings

THE following discussion of the function of the various parts of the ear is based on the principles of anatomy and physiology of the human ear. The ear is a complex organ, and its function is to receive and transmit sound waves to the brain. The ear is divided into three main parts: the outer ear, the middle ear, and the inner ear. The outer ear, or pinna, is the visible part of the ear. It is made of cartilage and skin. Its function is to collect sound waves and direct them into the ear canal. The ear canal is a tube that leads from the outer ear to the eardrum. The eardrum, or tympanic membrane, is a thin, flexible membrane that separates the outer ear from the middle ear. When sound waves enter the ear canal, they cause the eardrum to vibrate. These vibrations are transmitted to the ossicles, which are three small bones in the middle ear. The ossicles are the malleus, the incus, and the stapes. The malleus is attached to the eardrum, and the incus is attached to the malleus. The stapes is attached to the incus and the oval window of the cochlea. The cochlea is a spiral-shaped structure in the inner ear. It is filled with fluid and contains the organ of Corti, which is the part of the ear that converts sound waves into electrical signals that the brain can understand. The organ of Corti is made up of hair cells and supporting cells. The hair cells are the part of the organ of Corti that are in contact with the fluid in the cochlea. When the stapes vibrates, it causes the fluid in the cochlea to move, which in turn causes the hair cells to vibrate. This vibration creates electrical signals that are sent to the brain via the auditory nerve.

As U.S. Sen. Ray, R., Kan., said yesterday, for modern oil and natural-gas fields, there are four winning sides to every excess oil barrel that is produced. The large crude-drift-off the strong oil companies increases the income earned by the producing operations; the savings, again, in cost contrast with the increased value of the exports.

While this technology is designed primarily to remove excess oil, the low surface tension helps to prevent the supply of oil for lubrication at high speeds.

NEWS FROM THE SHIPYARDS

The American Salt Company of San Pedro, California, is having two 200-ton barges (above) equipped with 100-horsepower each, installed in the barge San Quentin at San Pedro. The barge, which is 40 feet long by 18 feet beam, will be used in transporting salt from the Mexican plants to San Pedro. If the business warrants, another hull will be built in the near future.



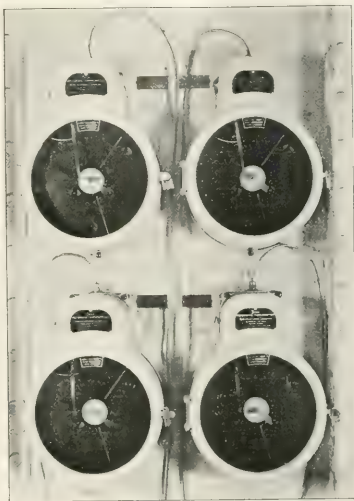
A new type venturated piston ring made by the American Hammered Piston Ring Company, which promises to solve some of the lubricating problems of modern high speed reciprocating engines.

Checking Refrigerator Temperatures

IN HANDLING general refrigerated cargo, it is desirable to keep a close check on the temperatures for two reasons. First, for best results, certain classes of cargo must be held at constant temperature within certain narrow marginal limits. Second, economy in operation of the refrigeration machinery demands this supervision.

The Matson Navigation Company's liner Malolo has a fine refrigeration plant servicing 21,000 cubic feet of cargo space divided into four compartments. To keep an accurate check on the temperatures in these compartments the vessel is fitted with four standard Tycos recording mercurial actuated type thermometers grouped together in a convenient location, as shown in the illustration. These instruments are connected by copper capillary tubes to the sensitive actuating elements in the refrigerated compartments. They are closely calibrated in place, so that there is no difference between the recorded temperature and that actually existing in the refrigerated hold, although one sensitive element is 65 feet distant from its recording device.

The temperatures recorded range



Battery of four Tycos recording type thermometers for checking refrigerated cargo temperatures on the Matson liner Malolo.

from 20 degrees below zero, Fahrenheit, to 60 degrees above. The charts cover a period of seven days, with one setting. All low temperatures are recorded at the outer edge of charts.

This convenient grouping of the instruments makes for more accurate check and saves the time and energy of the attendant engineer.

A Portable Lighting Unit

A PORTABLE acetylene flare light has been added to the line of the Oxweld Acetylene Company, 30 East 42nd Street, New York. This flare light is extremely powerful and has many outstanding advantages as a portable lighting unit.

The fuel used is acetylene, produced from Carbic. This material is in the form of cakes of uniform size and cylindrical shape. Several cakes of Carbic, enough to operate the flare continuously for 12 hours, can be placed in the light at one charging. If the use of the light is discontinued before the entire charge is used, the portion remaining can be left in the holder, or, being dry, solid, and clean, can be slipped back into the drum for later use. The operating cost of

this light per hour of service is very low.

This bare light operates equally well under all climatic and weather conditions. It is equipped with a storm-proof burner, permitting its use even in the most violent gales.

Construction is extremely rugged and simple. There are but three parts, and these cannot be incorrectly assembled. Charging is a one-man job which requires only a few minutes. When the light has been put into operation it needs no further attention until the charge is exhausted.

An automatic feed allows water to come into contact with the lowest cake of Carbic until sufficient acetylene is generated to drive the water out of the gas bell to a level below the bottom of the cake. This

process is continually repeated during the operation of the light and gas generation is uniformly and safely maintained at a pressure of less than 1 pound per square inch. The Carbic never rests on a pad of sludge since the residue settles to the bottom of the water.

In case the light is accidentally upset, the water runs out of the container and gas generation stops immediately. This light, because of its power and dependableness, is suitable for subway and tunnel operations and night work of all kinds, including stock piling, excavating, building construction, paving, loading cargo aboard ship, and harvesting ice. It is indispensable for railroad and telephone emergency work.

Carbic flare lights are manufactured by the American Carbolic Company, Inc., and the Oxweld Acetylene Company are sole distributing agents. Carbic, the fuel used, is marketed exclusively through Union Carbide Sales Company, New York. Both products are handled by jobbers in principal cities.

A New Metal Shade for Shipyard Workers

A SAN FRANCISCO firm has recently put on the market an eyeshade suitable for welders and shipworkers. This shade is made of aluminum base, strong, light, and absolutely fire-proof. It has been adopted by the United States Steel Corporation, the General Electric Company, Pullman Company, and others, and is strongly recommended by the Maryland Casualty Company. The manufacturers, S. E. Knowles Company of San Francisco, claims that this simple device precludes any damage to the eyes or face by reason of fire, as the Alumalite Visor will not burn. The State Department of Labor of Colorado has condemned the use of the old style visors or shades and holds the use of non-inflammable ones necessary.

The Alumalite Visor is finished in duco and is made in different styles to suit special conditions. Sometimes the use of a simple article like this will save a serious accident, as injury to the eyes is considered by insurance companies as a major casualty.

Automatic Dynamometer Control Panels

THE General Electric Company has recently developed a fully automatic dynamometer control panel for use with both reciprocating and turbine engines. The panel is designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque. The panel is designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque.

The new control instrument has been designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque. The panel is designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque.

The automatic control panel has been designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque. The panel is designed to control the engine speed and torque, and to provide a means of controlling the engine speed and torque.

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Books Wanted

Books for sale or exchange at the San Francisco Seamen's Church Institute.

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"Robras 20-20"

IN these days of fuel economy, the reduction of weight and increase of efficiency of fittings are important. In the application of steam heat to the engine room and to crew's quarters and office space, the use of heavy cast iron radiators involves the naval architect in the task of providing additional displacement for a considerable weight. At the same time the inefficiency of this apparatus makes it large and clumsy, so that it occupies valuable space. To offset these disadvantages, a brass radiator, known as Robras, has been introduced.

"Robras 20-20" is a steam radiator made from rolled sheet brass welded into shapes, any number of which can be assembled into a unit forming a complete heater. The

weight of the brass radiator is only one-tenth that of the cast iron radiator of the same capacity.



A "Robras 20-20" brass radiator compared with a cast iron radiator of the same capacity.

Trade Notes

Charles C. Brooks, handling the marine installation work for Fairbanks-Morse diesel engines in the San Francisco territory, and who was seriously injured in an automobile accident some weeks ago, is happily recovering, though it will be some time before he will be on the "front" again.

Chas. E. Ker, who for several years has been outside man for the Main Iron Works, San Francisco, has lately become associated with the Robert O. Bossinger Co., wholesale hardware importers and exporters, of San Francisco.

Marine Insurance

Edited by JAMES A. QUINBY

West Aleta Reversal Dismays Pacific Coast Underwriters

FOR six years members of the marine insurance fraternity on the Pacific Slope have pointed to the various West Aleta decisions as unimpeachable expositions of the law of deviation. On the street, on the golf links, and other spots where insurers foregather, the West Aleta has always been happily regarded as a ship of good luck, carrying a million dollars in recoveries to local offices. We doubt not that in the long winter evenings, when the wolves were howling at the doors of sundry members of our local fraternity and the bleak and bitter winds of financial depression ruffled the red lettered lines of the annual balance, sorrowing wives and children have been cheered up and reassured by reference to the forthcoming era of good fortune which should be theirs when the West Aleta finally came home to roost.

The West Aleta came home, but upside down. On February 20 the Supreme Court reversed the decision of the Circuit Court of Appeals, and ordered the District Court to dismiss the various libels filed in 1922 on behalf of Pacific Coast shippers and their underwriters, represented by McCutchen, Olney, Mannon & Greene, against the United States Shipping Board Emergency Fleet Corporation, represented by Ira S. Lillick and Chalmers Graham.

The decision is of such far-reaching importance we deem it worthy of reprinting in full.

Mr. Justice Sanford delivered the opinion of the Court.

These are consolidated libels in personam, brought in admiralty by the respondents against the Shipping Board Emergency Fleet Corporation in the Federal District Court for Northern California in October, 1922, and November, 1923, to recover the value of goods shipped by them in December, 1919, and January, 1920, from San Francisco to ports in Wales and Holland, on the West Aleta, a merchant vessel owned by the United States and operated by the Fleet Corporation. The libels alleged that the vessel deviated from the agreed voyage, passing the destined ports without entering and proceeding on a voyage to a port in Germany, and that in the course and by reason of such deviation the vessel strand-

SPRING

EVERY poet must write one about SPRING.
This is IT. Customers are requested to YAWN
before reading.

Oh—h—h—Hum!

'S a great day. The hills

Are tinged with green. The bills

(Disgusting things in black and white) have just come
through.

Debit one light gray suit and navy tie. Old loves for new.

Green hills . . . new tie . . .

. . . bills . . . and I . . .

Oh—h—h—Hum! I'm tinged with blue.

I've got the most intense distaste for work I've ever had,

And if these lines don't rhyme or scan

Thass just too bad.

I fain would hie me forth and greet

Some nymph whose gauzy draperies

Are friendly with the southern breeze.

. . . Soft melodies

And dimpled knees . . .

Oh—h—h—Hum! Yes, Spring has come

To California Street.

—J. A. Q.

ed upon an island in the North Sea and became a total loss, with all her cargo. The Fleet Corporation filed exceptions to the libels on the ground, among others, that they were filed more than one year after the Suits in Admiralty Act had gone into effect and that by and under the provisions of that Act and particularly Sec. 5 thereof the alleged causes of action were barred. These exceptions were overruled. 295 Fed. 372. The Fleet Corporation then answered, relying on the liberties clause in the bills of lading, denying that there had been any deviation, and alleging that the loss was caused by risks and perils for which it was not liable under the bills of lading and the Harter Act. The District Court, on the hearing, finding that there had been an unauthorized deviation and that the suits were not barred or affected by the Suits in Admiralty Act, entered decrees in favor of the libelants for the value of the goods, with interest at the rate of 7 per cent. 7 F (2nd) 893. These were affirmed by the Circuit Court of Appeals, which held that there had been an unwarranted deviation and that the Suits in Admiralty Act was not applicable, since its purpose was to substitute an action in personam for

one in rem, and no suit in rem could have been brought as the vessel had been wrecked off the coast of a foreign country and was a total loss. 12 F (2d) 721.

The first contention of the Fleet Corporation is that these suits were barred by the limitation contained in Sec. 5 of the Suits in Admiralty Act.

That Act, whose main provisions are set forth in the margin, was approved and went into effect on March 9, 1920, several months after the alleged causes of action had arisen and more than a year before the libels were brought. It provided that no vessel owned by the United States or any corporation in which the United States or its representatives own the entire outstanding capital stock, or in the possession of or operated by or for the United States or such corporation, should be subject to arrest or seizure by judicial process, Sec. 1; that where such vessel was employed as a merchant vessel and a proceeding in admiralty could be maintained if it were privately owned or operated, a libel in personam might be brought against the United States or such corporation, as the case might be, Sec. 2; and that suits based on causes of action arising prior to the Act should be brought within one year after it went into effect, Sec. 5.

It is unquestioned that the Fleet Corporation is one which may be sued by a libel in personam under the provisions of the Act. In *Eastern Transp. Co. v. United States*, 272 U. S. 675, 689-692 (1927), we held that, while the main purpose of the Act was to exempt from seizure and arrest merchant vessels of the United States operated by it and its subordinate shipping corporations and to substitute for a suit in rem one in personam attended with the incidents of a proceeding in rem in which the personal liability of the United States took the place of the vessel, the Act also had a wider

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LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

to install adequate equipment and to take on a British wireless operator.

This was all very good so far as the British were concerned, but when the unfortunate operator arrived at a Turkish port, the local authorities solemnly invoked their law that none but native Turks may be employed on Turkish ships and arrested the Britisher, who is liable to three months imprisonment and \$500 fine.

Local cargo underwriters have recently received approximately \$60,000 in settlement of claims arising from the total loss of cargo carried by the ill-fated Northland, sunk in collision with the Pacific Trader off the Golden Gate on July 21, 1927.

The case received considerable notoriety in the newspapers at the time due to the fact that the Northland carried a quantity of explosives. As was the case with the Yosemite, which went ashore in 1924 at approximately the same location, the vessel was christened the Dynamite Ship, and numerous reports were circulated to the effect she had blown up. As a matter of fact, the Northland was towed in and beached in San Francisco Bay in a water-logged condition and the hull and remaining cargo were later sold at auction, realizing a sum which was not sufficient to pay the salvage charges.

Furness-Withy & Company, owners of the Pacific Trader, have had to bear the brunt of the entire liability to cargo inasmuch as the Northland was a total loss. The Pacific Trader interests were represented by Ira S. Lillick while the settlement was handled on behalf of the cargo underwriters by the law firm of Derby, Sharp, Quinby & Tweed.

The Study Class of the San Francisco Association of Marine Underwriters at its meeting of February 14 celebrated St. Valentine's Day by listening to discussions of the Warehouse to Warehouse Clause and Iron and Steel as Subjects of Marine Insurance, delivered respectively by Wilfred Page, of Geo. E. Billings Co., and A. L. Becker, consulting engineer.

Mr. Page traced the history of the warehouse to warehouse coverage from the time of its first general adoption in 1880 down through a series of changes to its present standardized form under which the goods are covered from the shipper's warehouse at point of shipment to consignee's or other warehouse at the destination named in the policy, or until the expiry of fifteen days from the discharge from the overseas vessel, whichever shall first occur. The clause, as the speaker phrased it, is one of those which appears perfectly clear until after a loss occurs. Difficulties in interpretation have arisen and will continue to arise with

both the attaching and termination of the risk in this clause, especially with shipments originating at an inland point and awaiting transshipment at ports of export, and with shipments arriving at ports of destination where the customs warehouse is used as a storage point by the consignee.

Mr. Page is of the opinion that the intent to cover the goods while in transit is clear from the historical derivation of the clause and that technical questions as to what constitutes a warehouse should not be allowed to interfere with this basis intent.

The second speaker of the evening was A. L. Becker, consulting engineer of San Francisco, who is well known to maritime men of the Pacific Coast by reason of his exploits in the field of tonnage valuation, especially in connection with oil tankers.

Mr. Becker gave a simple and concise outline of the iron and steel industry, describing the various types of crude and final products which are subjects of transportation. He emphasized the characteristics of cast and malleable products in connection with their susceptibility to rust and breakage. In answer to questions from the floor, he touched upon the prevalent epidemic of "white rust" on galvanized iron shipments, which seemed to be a tender subject with the underwriters present.

At the meeting of February 27, the Class listened to a discussion of cargo stowage and ventilation delivered by Ray Demoro, dock superintendent for the Transmarine Corporation at San Francisco. Mr. Demoro, drawing upon his long experience in loading for various companies on the Pacific Coast, gave his opinion as to the proper method of handling diverse classes of commodities. He also touched upon the white rust problem, asserting that it was practically impossible to avoid in cases where galvanized sheets were loaded at a low temperature.

The speaker was emphatic in his approval of complete ventilation of holds at all times during inter-coastal voyages, in spite of the success reported by some companies in closing holds to ventilation whenever the temperature was rising.

The second speaker of the evening was Harold M. Sawyer, well-known admiralty attorney of San Francisco, who opened his talk by a short discussion of the recent decision of the United States Supreme Court in the West Aleta case, reference to which will be found elsewhere in these columns.

The main topic of discussion had to do with the question of the right of stockholders in a corporation to

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DOUGLAS 6400

INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

limit their liability under the limitation statute for damages asked in connection with injuries received on board a vessel owned by the corporation. The precise question is present in the case of Flink versus Paladini, et al, where Judge St. Sure of the District Court in the Ninth Circuit, has recently ruled that a petition to limit liability, entailing an injunction against actions already commenced, did not affect suits against stockholders.

Mr. Sawyer was of the opinion

that such a holding is inequitable, and tends to destroy uniformity, in that stockholders under the California law could be sued independently for liability to their corporation, and still be unable to limit their liability if the ownership of a vessel is involved.

The case is now on appeal to the Circuit Court of Appeals. If the lower court's decision is upheld a considerable additional burden will be placed upon California's stockholders and their P. I. insurers.

Largest Derrick Barge

THE Merritt Chapman & Scott Corporation of New York has recently placed in commission a seagoing derrick barge known as the Monarch which is, as far as known, the largest seagoing floating derrick in the world.

This vessel was built by the Newport News Shipbuilding and Dry Dock Co., Newport News, Virginia, in the Ellis Channel System of Hull Construction, Patented.

The dimensions of the hull are:

Length over-all	156'0"
Breadth over-all	52'0"
Depth, molded	13'0"

The barge is designed for a maximum over the side boom lift of 300 tons. The owner, due to the watertight interior subdivision of the vessel, intends to eventually devise a ballasting system which will make possible a lift of 600 tons.

The design was prepared by the Ellis Channel System, W. G. Esmond, naval architect, and by A. Sieke of the Merritt Chapman & Scott Corporation, under the direction of D. Bailey, manager of the Marine Department of the Merritt Chapman & Scott Corporation. The Merritt Chapman & Scott Corporation considered several designs embodying plate and shape construction, but in view of the special nature of work that this vessel would have to undertake, it was decided, after an exhaustive study, that the Ellis Channel System would best meet the requirements.

The hull was delivered complete

by the builders. The hoisting machinery, "A" frame and boom were provided and installed by the owners. Portions of the old Monarch were utilized after having been modified to make them suitable for the larger lifting capacity of this vessel.

The hull of this vessel is divided into 19 water-tight compartments by transverse and longitudinal bulkheads, all of channel construction. Three longitudinal water-tight bulkheads run the full length of the vessel and three transverse water-tight bulkheads extend completely across the vessel.

G. E. Witt Expansion

THE G. E. Witt Co., Inc., of San Francisco, which has for the past thirty years been identified with the manufacture of regulating valves and fuel oil burners, has changed its name to the Vaughn-G. E. Witt Co., and on the first of April moved from its location at 862 Howard Street, San Francisco, to its own property on Hollis Street, near Park Avenue, Emeryville. On this tract, it has erected a fine brick factory, representing, with equipment and site, an investment of \$100,000. Here will be housed the latest in machines to turn out rapidly and well the many steam specialties handled by the company.

C. W. Vaughn is president and general manager of the new organization, and is eminently fitted for the position, for in addition to being a good executive, he is a fine mechanic and, having been with the company for twenty years, he understands perfectly the product of the plant. J. R. Hooper, assistant to the manager, who has been some eighteen years with the firm, will look after the San Francisco office. F. R. Browne of Oakland, also over fifteen years with the company, will retain his position as secretary and sales manager; while Charles Bartells, for many years shop foreman, will continue in the same capacity at the new plant.

This combination insures prompt and courteous attention to all client requirements, and the same high standard of products.



The Merritt Chapman & Scott Corporation seagoing derrick barge Monarch.

Three new combination passenger and freight liners to cost upward of \$5,000,000 each for the San Francisco-Australia-New Zealand-South Seas trade are being planned by the Matson Navigation Company, which now operates three vessels in this service purchased from the U. S. Navy.

Mr. W. P. Roth, president of the company made this announcement recently, but said the construction program was contingent upon the passage by Congress of the White Bill. To quote Mr. Roth these vessels will be built "if the White Bill passes enabling

the government to lend us money. Under the provisions of this bill, we would be granted a subsidy or given a mail contract to run not less than ten or more than twenty years." The ships contemplated would be of sufficient size to accommodate 350 first class passengers, 250 second class passengers, and 7000 tons of freight.

Export Steamship Corporation May Also Build

Henry Herbermann, president of the Export Steamship Corporation of New York has announced to the Shipping Board that his company would in all probability build three 18-knot passenger and freight vessels for the New York-Mediterranean service in the event that Congress passes the White Bill authorizing long-time mail contracts and a construction loan fund at low interest rate for American shipowners.

Golden Gate Ferry Company Extension up to Railroad Commission

The Boards of Supervisors of San Francisco and Marin Counties have granted franchises to the Golden Gate Ferry Company to operate between San Francisco and Point San Quentin, near San Rafael. The matter is now up to the Railroad Commission to give its sanction to the new ferry line. If this is done, considerable construction of fast ferriboats will be necessary, also the construction of a terminal and bus service at Point San Quentin.

The Golden Gate Ferry Company received the new ferriboat Golden Age on March 1 from her builders the General Engineering & Drydock Company.

Tacoma to Have New Fireboat

The citizens of Tacoma, Washington, on March 13, approved a bond issue for the construction of a new fireboat and for the installation of a new fire alarm system.

Bethlehem Launches Steamship Waialeale

The steamship Waialeale was launched at the yard of the Bethlehem Shipbuilding & Drydock Corporation, San Francisco, on March 3. This vessel, built for the Inter-Island Steam Navigation Company of Honolulu, is 310 feet long, 48 feet beam, equipped with geared turbines developing 2000 horsepower. She will cost \$1,500,000 and will carry both passengers and freight between Honolulu and the Island of Hawaii and Kauai.

Some Recent Shipbuilding Orders

Albina Marine Iron Works, Portland, Oregon, of which William Cornfoot is president and general manager, has received the contract for the construction of three lightships for the Bureau of Light-houses, Department of Commerce. The ships will be 135 feet long, 11 feet draft, of 630 tons displacement. They will be equipped with diesel-electric power plants. Unusually comfortable accommodations for the officers and crew have been specified, and particular attention will be given to the stores for food, extra large refrigerating plants making these ships capable of maintaining themselves without new supplies for an entire year.

The order for the power plant was awarded to the Winton Engine Company. Equipment for each vessel will consist of four 112-horsepower 4-cylinder Winton diesel engines, each direct-connected to a General Electric generator and three 400-horsepower General Electric motors. Orders for pumps, compressors, hoists, and windlass were awarded separately, and all will be electrically driven.

Bids were opened last October for these vessels and were published in the December 1927 issue of Pacific Marine Review. Lightship No. 100, the first of the three ships, is to replace Ship No. 70 opposite the Golden Gate.

Collingwood Shipyards, Ltd.,

Collingwood, Ontario, has an order from the Dept. of Railways and Canals of Canada for a hopper barge of 800 tons deadweight, 180 feet long, 32 feet beam, 13 feet load-draft; to be powered with 700 horsepower triple expansion engines giving a speed of eight miles an hour, loaded; two Scotch boilers of 12ft. 6in. in diameter.

Dravo Contracting Co. has an order from the New York Central Railroad for four steel carfloats, 270 by 38 by 10ft. 5in. of 850 gross tons each; cost about \$100,000 each. This yard also has entered an order for its Contract Department for 10 standard steel barges, 100 x 26 x 6ft. 6in. Also three other steel barges for stock.

Midland Barge Company, Midland, Pa., has an order for a steamboat hull for the Union Barge Line Corp. of Pittsburgh, 151 by 34 by 6 ft. 6 in.; four hopper barges for the West Penn. Sand & Gravel Co., Rochester, Pa.

Newport News Shipbuilding & Drydock Company, Newport News, Va., has an order from Geo. T. Baker, Jr., for a steel yacht of 1200 gross tons.

Todd Drydock, Engineering & Repair Corp., Brooklyn, has an order from Warner & Quinlan Co. for two oil barges of 233 gross tons each.

Madden & Lewis, boat builders



Dock Co., Feb. 8, 16, and 18; derrick scow for City of Detroit, Nov. 5.

Sand and gravel barge for Nugent Sand Co. by Howard Shipyards & Dock Co., Feb. 4.

Towboat for E. T. Slider, New Albany, Ind., by Midland Barge Co., Mar. 1.

Two deck barges for Granville Stone & Gravel Co. by Nashville Bridge Co., Feb. 28 and Mar. 5.

Stern-wheel towboat for stock by Chas. Ward Engineering Works, Feb. 28.

Scout cruiser for U.S. Navy by American Brown Boveri Electric Corp., Mar. 7.

LAUNCHINGS

Waialeale, twin screw passenger and freight steamer for Inter-Island Steam Navigation Co., by Bethlehem Shipbuilding Corp., San Francisco, Mar. 8.

Robert W. Stewart, tank steamer for Standard Oil Co. (Ind.) by American Ship Building Co., Dec. 3.

Cadillac, automobile ferryboat for Detroit & Windsor Ferry Co., by Great Lakes Engineering Works, Mar. 10.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of March 1, 1928.

Pacific Coast

BETHELEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson. Steel dredge hull, for U. S. Smelting, Refining & Mining Co., Oakland, Calif.; 163x60x12 ft.; 10 cu. ft. buckets.

Three steel dredge hulls, sisters to above. 100x50x11'4"; 6 cu. ft. buckets; deliver Apr. 1/28 est.

Waialeale, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4 1/2" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 400 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12-268 sq. ft. heating surface; keel Nov. 15/27; launched Mar. 3/28; deliver June 1/28 est.

GENERAL ENGINEERING & DRYDOCK CO., Alameda, California

Purchasing Agent: Al. Wanner.

Golden Age, hull 12, diesel-electric wood-auto ferry for Golden Gate Ferry Co.; 240 L.O.A.; 44 beam; 10'6" loaded draft; 3 400 H.P. Ingersoll-Rand diesel engs.; Westinghouse 950 S.H.P. motors; keel Oct. 25/27; launched Jan. 14/28; delivered Mar. 1/28.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wa. n.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x36x11 ft.; launched Oct. 5/27.

J. J. Hennen, diesel tug for J. J. Hennen & Bro. by Howard Shipyards & Dock Co., Feb. 14; wharf barge for Ohio River Sand Co., Louisville, Feb. 28.

Four steel barges for E. T. Slider, New Albany, Ind., by Midland Barge Co.; three barges for plant account.

Yorktown, bay steamer for Chesapeake Steamship Co. by Newport New Shipbuilding & Drydock Co., Feb. 25.

DELIVERIES

Golden Age, diesel-electric auto ferry for Golden Gate Ferry Co., San Francisco, by General Engineering & Drydock Co., Mar. 1.

Two dump scows for Monongahela & Ohio Dredging Co. by Dravo Contracting Co., in Feb.; two steel hulls for pile drivers to Merritt, Chapman & Scott Corp., in Feb.

Barge to Oil Transfer Co., New York, by Federal Shipbuilding & Drydock Co., Feb. 28.

Two flat scows to Great Lakes Dredge & Dock Co., by Great Lakes Engineering Works, March 10.

Crane, hull 125, patrol boat for U.S. Bureau of Fisheries, Seattle; 90 L.B.P.; 20 beam; 13'5"; loaded draft; 200 H.P. Washington-Estep diesel engs.

Northern Light, hull 134, twin screw cannery tender; for Northern Light Packing Co., Cordova, Alaska; 55 L.B.P., 13 beam.

Hull 135, fish scow for Alitak Packing Co., Seattle; 55 by 18 by 4 ft.

Hull 136, same as above.

Hull 137, fish scow for P. E. Harris & Co., Seattle; 60' long by 16' beam.

Hull 138, same as above.

Hull 139, pot scow for P. E. Harris & Co., 28'x10'x2'10".

Hull 140, same as above.

Hull 141, cannery tender for P. E. Harris & Co., Seattle; 76'x18'x8'6".

Hull 142, scow for Libby, McNeill & Libby, Seattle; 72'x24'x5'6".

LAKE WASHINGTON SHIPYARDS, Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Not named, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P.; 57' beam; 800 I.H.P. Washington-Estep diesel eng.

Cannery tender for New England Fish Co., Seattle; 72' length; Washington-Estep diesel eng; launched.

Purse seine boat for Dick Suryan; 72' long; 180 H.P. Washington-Estep diesel eng.

River boat for Capt. Frank Kern; 60' long.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

One halibut fishing boat for John Ivarsen, 58'x14'6"x6'4"; 60 H.P. Fairbanks

launch Mar. 6/28 est.; deliver Mar. 19/28 est.

One halibut fishing boat for Hans Underdahl, 58'x14'6"x6'4"; keel Dec. 19/27; launch Mar. 6/28 est.; deliver Mar. 19/28 est.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY, Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar. Ten covered barges for Carnegie Steel Co., 175'x26'x11'.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7'.

AMERICAN BROWN-BOVERI ELECTRIC CORP., Camden, N. J.

Purchasing Agent: L. G. Buckwalter. Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching. Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'4 1/2"x11'6"x180 lbs. pressure; keel Aug. 29/27; launched Dec. 3/27; deliver Apr. 15/28 est.

Not named, hull 803 motor tanker for Lake Tankers Corp.; 34 L.B.P.; 51 feet beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Westport diesel engs.; aux. Scotch boiler; keel Dec. 12/27.

BETHELEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Lexington, hull 1300, airplane carrier U. S. N., launched Oct. 3/25; commissioned Dec. 14/27.

No. 45, electric cutter for U. S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse, for Detroit & Windsor Ferry Co.; 156 horse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, diesel-electric freighter for Middlesex Transportation Co., New Brunswick, N.J.; 131 x 31 x 11 ft.; Winton-General Electric machinery; electric auxiliaries; 12 mi. speed.

Not named, steel passenger and freight steamer for the New England Steamship Company, Newport, R.I.; 202 L.B.P.; 36 molded beam; 14'6" molded draft; 1082 gross tons; 4 cyl. TE eng.; B. & W. boilers, coal burning.

Not named, hull 1418, steel passenger and freight steamer for the Pennsylvania Railroad Co., West Philadelphia; 300 ft. length; TE engs.

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J. J. Hennen, hull 1637, diesel tug for J. J. Hennen & Bro., Hawesville, Ky.; 76 L.B.P.; 18 beam; 6 depth; 10 mi. speed; 220 I.H.P. diesel engs; keel Dec. 8 '27; launched Feb. 14/28; deliver Mar. 15/28 est.

Hull 1638, sand and gravel barge for Nugent Sand Co., Louisville, Ky.; 110' 10" x 38' x 7' depth; keel Jan. 26 '28.

Hull 1639, sand and gravel barge same as above; keel Feb. 4/28.

Hull 1640, wharf barge for Ohio River Sand Co., Louisville, Ky.; 132' x 30' x 4' keel Jan. 12/28; launched Feb. 28/28; deliver Mar. 10/28 est.

Hull 1641, towboat hull for Island Creek Coal Co., Cincinnati; 135' 6" x 26' 6" x 5'; keel Mar. 10/28 est.

Sally H. hull 1642, diesel towboat for T. L. Herbert & Sons, Nashville, Tenn.; 64' 8" L.B.P.; 18' beam; 3' 6" depth; 120 I.H.P. diesel eng. keel Mar. 15/28 est.

MANITOWOC SHIPBUILDING CORPORATION Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hulls 235 and 236, two dump scoops for Great Lakes Dredge & Dock Co., Chicago; 223' x 42' 4" x 15'; keel Dec. 1/27.

Hulls 237 and 238, two barges for U.S. Engineers, Milwaukee; 80 x 26 x 5 ft.; Ellis Channel steel hull construction.

Hull 239, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 100 x 37' 6'.

Hull 240, derrick hull for Fitzsimmons Connell Dredge & Dock Co., Chicago; 120 x 30' 7'.

Hull 241, diesel tug for Great Lakes Dredge & Dock Co.; 114' 6" L.B.P.; 27' beam.

Hull 242, steam tug for Fitzsimmons Connell Dredge & Dock Co.; 75' x 16'.

Hull 243, 800-yd. dump scoop, for Fitzsimmons Connell Dredge & Dock Co.; 136 x 37 ft.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Stern wheel towboat for Magdalena River, Colombia; 168 x 42 x 5 ft.; keel Nov. 8/27; launched Mar. 1/28.

Twenty steel hoppers cargo barges for Magdalena River, Colombia; 125 x 26 x 6 ft.; 7 delivered.

Stern wheel towboat for South America; 170 x 42 x 5 ft.; keel Jan. 1/28; launch May 15/28 est.

MIDLAND BARGE COMPANY Midland, Pa.

Not named, towboat for E. T. Slider, New Albany, Ind.; 145' x 32 x 5 ft. 6 in.; steam tandem comp. eng. 14" x 28" x 7' 0" stroke; keel March 1/28.

One dredge hull for M. H. Treadwell Co. of New York; 150' x 70' x 13' 6'.

Four steel sand barges for E. T. Slider, New Albany, Ind.; 120' x 30' x 7' 6'; launched.

Two steamboat hulls for Union Barge Line, Pittsburgh; 151' x 34' x 6' 6'.

Three barges for Plant Account, 100 x 26 x 6'; launched.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151' x 34' x 6' 6'.

Four hopper barges for West Penn. Sand & Gravel Co., Rochester, Pa.; 100 x 20 x 6' 6'.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 136 deck barge for Bedford Nugent Co.; 110' x 28' x 7' 3'; keel Mar. 12/28 est.

Hull 137, same as above; keel Mar. 19/28 est.

Hull 138, deck barge for Granville Stone & Gravel Co.; 130' x 32' x 8'; keel Feb. 21/28.

Hull 139, same as above; keel Feb. 28/28.

Hull 140, same as above; keel Mar. 5/28.

Hull 141, deck barge for Big Rock Stone & Mat. Co.; 100' x 26' x 6' 6'.

Hull 142, tug for stock; 44' x 9' 6" x 4' 3"; 80 H.P. Worthington diesel.

Hull 143, deck barge for International Cement Co.; 180' x 40' x 9' 6'.

Hull 144, same as above.

Hull 145, same as above.

Catharine D., hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P. diesel engs.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel Apr. /28 est.; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launched Feb. 25/28.

Not named, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613' 3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27.

W. J. Harahan, hull 327, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14' 6" depth; one screw; T. E. eng.; Scotch boiler; coal burning; keel Jan. 16/28; launch Mar. 31/28 est.

Not named, hull 328, steel yacht for Geo. T. Baker, Jr.; 1200 gross tons.

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Trade, Traffic, and Shipping

Fifteenth Foreign Trade Convention

Meeting of the National Foreign Trade Council at Houston, Texas, Offers Instructive Program, Profitable Contacts and Interesting Excursions

FIFTEEN hundred delegates from all parts of the United States to the Fifteenth National Foreign Trade Convention will meet at Houston, Texas, on April 25, 26, and 27 next, announces O. K. Davis, Secretary of the National Foreign Trade Council. The principal theme of the convention will be our trade with Latin America. Business delegations from more than ten Latin-American countries will confer with American business executives from more than 30 states of the Union. American sales and distribution practices most successful south of the Rio Grande, and import, credit, banking and advertising questions of vital interest to North and South American trade will be under discussion.

This convention is of unusual importance as an incentive to keep our trade supremacy in Latin America. Already more than one-quarter of the manufactured goods exported from America are sold in Latin American countries, and our pre-eminence as a source of supply to every Latin American country has been a new factor in our world trade since 1925. In 1927 our total trade with Latin America was close to \$2,000,000,000, slightly greater than the combined trade of our three principal competitors, England, France, and Germany.

A feature of the program will be



American Ship St. Paul, built by Chapman & Flint at Bath, Maine, in 1874; now in Lake Union. Seattle, being unrigged and converted into a barge.

a series of nine addresses on the basic factors of export merchandising which will take the place of the usual group sessions of the convention. The whole subject of export practice from preparatory market analysis straight through to legal protection, trade marks, and patents, will be covered by these addresses, including the topics distribution, merchandising, credit and finance, advertising, dealer cooperation, packing and shipping, and

insurance. Delivered by nation-wide authorities on export practice, they will constitute a course in fundamentals that will form a unique contribution to foreign trade literature.

Some of the speakers who have already accepted the Council's invitation to be at Houston include George P. Auld, of Haskins & Sells, New York, formerly Accountant-General of the Reparations Commission, who will speak on "The Prospects in Europe"; Norman F. Titus, Chief, Transportation Division, Bureau of Foreign & Domestic Commerce, who will speak on "Fundamentals of an American Merchant Marine"; William Werckenthien, Export Manager, Island Petroleum Co., Baltimore; Lawrence Langner, of Langner, Parry, Card & Langner, New York City; and Allen B. Cook, vice-president, Guardian Trust Co., Cleveland. James A. Farrell, Chairman of the National Foreign Trade Council, will deliver the closing address on "Foreign Trade Progress."

A post convention feature will be a special tour to Mexico arranged by the Federated Chambers of Commerce of Mexico. The special train which will carry the delegates will stop at Torreon, Tampico, Monterey and other important Mexican cities on the way to Mexico City. The delegates will be receiv-



Large group of former foreign traders in winter quarters. This is the famous sailing ship fleet of the Alaska Packers Association at its dock at the port of Alameda, California. These fine tall ships, the last large sailing ship fleet, are gradually being replaced by steamers.

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The S.S. Munson sails for Porto Rico on April 28th.

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SS. West Cape	Apr. 14	Apr. 14	SS. West Cape	Apr. 11	Apr. 11
SS. West Cape	May 1	May 1	SS. West Cape	May 1	May 1
SS. West Cape	May 1	May 1	SS. West Cape	May 1	May 1
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ed at the capital by President Calles and will stay there five days as the guests of the Mexican Government, returning to Houston by way of San Antonio.

On the afternoon of April 26 a trip will be taken down the Houston Ship Channel, when delegates will have at their disposal a United States Shipping Board vessel and will be served luncheon on board.

The Trade Adviser Service will offer answers to the usual foreign trade problems by the Council's expert panel of foreign traders who will serve throughout the convention for this purpose, and will place their experience at the disposal of hundreds of delegates throughout the Southwest who are just beginning an exporting business.

ber Co.; American str. Malsah Maru, North Pacific to North of Hatteras, \$13.50, Apr.-May; British str. Sheaf . . . , North Pacific to St. Lawrence, \$15, Apr.-May.

The following tanker fixtures are reported: American tanker Atlantic Sun, California to North of Hatteras, 56c, Mar., clean; another tanker, same, April; another tanker, same, clean, 59c; American tanker M. F. Elliott, San Pedro to Boston, 62c, Mar., clean; American tanker Joseph Seep, California to North of Hatteras, 57c, April 10 to 30 cancelling, 75,000 barrels; Norwegian tanker Ranja, California to four ports, Australia or New Zealand, 32/6, Apr.-May.

The Japanese str. Jufuku Maru is reported fixed from the North Pacific to U. K.-Continent, wheat and lumber, Apr. loading, by Canadian American Shipping Co.; the British m.s. King John, from Puget Sound and British Columbia to South Africa, lumber and merchandise, Mar.-Apr., J. J. Moore & Co.; and the British steamer Pennyworth, from Grays Harbor and Puget Sound to Rotterdam and Hamburg, lumber and merchandise, Apr. loading, Canadian American Shipping Co.

The following time charters are reported: Japanese str. Hasshu Maru, one round trip, delivery Japan via North Pacific, yen 1.60, Yamashita Co.; British m.s. Enton, 1 year, Pacific trade, delivery Caliao, \$1.40, Mar., J. J. Moore & Co.; Swedish m.s. Fermia, two years, Pacific trade, June, W. L. Comyn & Co.; Norwegian str. Augvald, Pacific trade, del. and redel. North of Hatteras, 95c, Feb.; Swedish str. Unden, San Francisco and North Pacific to U. K.-Continent, lumber and merchandise, May, W. L. Comyn & Co.; Danish str. Uranienborg, one trip intercoastal, delivery North of Hatteras, redel. same via B.C., lumber, \$1.12½, Mar.; Norwegian str. Eir, del. and redel. North of Hatteras via B.C., 90c, prompt; American str. W. R. Chamberlin, Jr., one round trip West Indies, delivery and redelivery North Pacific, Hammond Lumber Co.

The following sales are reported: 21 steamers American - Australia Orient Line, reported \$1,981,000, U.S. Shipping Board to American-Hawaiian Steamship Co. and Matson Navigation Co.; 11 steamers Oregon Oriental Line, reported \$1,065,000, U.S. Shipping Board to K. D. Dawson; 7 steamers American Oriental Line, reported

Freights, Charters, Sales

March 15, 1928.

THE following steamers are reported fixed with grain from the North Pacific to U. K.-Continent: Br. str. King Bleddyn, 29/6, March, Canadian Cooperative Wheat Producers, Ltd.; British str. Bengloe, 30/-, March, Wm. H. Pim, Jr.; British str. . . . Moor, 30/-, Mar./Apr., same charterers; Japanese str. Denmark Maru, 30/-, Apr., Kerr Gifford & Co.; a steamer, 31/-, Apr., Balfour Guthrie & Co.; British str. Leeds City, 29/6, Apr., Heatley & Co.; Smith steamer, 29/6, Apr.; British str. Anthea, 30/-, Mar.; a steamer, 29/6, Mar.; Italian steamer, 31/6, Mar.; a "K" Line steamer, 27/6, Apr.-May, Canadian Cooperative Wheat Producers; a steamer, 27/3, May; British str. King Alfred, 31/-, Apr., Balfour Guthrie & Co.; a Smith str., 30/-, option Antwerp or Rotterdam, 29/6, Mar.; Dutch str. Aldebaran, 30/-, option Antwerp or Rotterdam, 6d. less, Heatley & Co.; British str. King Edward, 30/-, option Antwerp or Rotterdam, 29/6, Greece 36/3, Apr., L. Dreyfus & Co.; British str. Waziristan, 29/-, option Antwerp or Rotterdam, 28/6, Apr.; British str. Great City, 29/-, Apr., Antwerp or Rotterdam, 6d. less; British str. Siltonhall, 29/6, Antwerp or Rotterdam, 6d. less, April; a steamer, 27/6, Antwerp or Rotterdam, 6d. less, Apr., Heatley & Co.; a King steamer, 29/6, option Antwerp or Rotterdam, 29/-, Mar.; a steamer, 31/-, Mar.-Apr.; Ben, str., 30/-, Antwerp or Rotterdam, 29/6, Mar.-Apr.; King str., 30/-, Antwerp or Rotterdam 29/6, Apr.; British str. Indian City, 29/6, Antwerp or Rotterdam, 29/-; if Prince Rupert 9d. extra, Apr.; British str. Tremeadow, Vancouver to Antwerp, 28/9, Mar., Dreyfus & Co.; British str. Anglo . . . , Vancouver to Antwerp or Rotterdam, 28/-, Apr.; Dutch str. Flensburg, same, 27/9, Apr.; British str. Gullpool, same, 28/-, Apr., Continental Grain Co.; Swedish str. Sydland, same, 27/9,

Apr., same charterers; British str. Spilsby, B.C. to Antwerp or Rotterdam, 31/-, March, Canadian Cooperative Wheat Producers; British str. Devon City, Vancouver to Avonmouth and London, 32/6, Mar.; British str. Peterton, Vancouver to Antwerp or Rotterdam, 27/-, Apr., L. Dreyfus & Co.; Japanese str. Yeifuku Maru, Portland to Naples, 30/6, Mar.-Apr., Strauss & Co.; a Japanese str., Vancouver to Italy, 30/-, Apr.

The following fixtures for lumber to the Orient are reported: Japanese str. Atsuta Maru, North Pacific to Yokohama, lump sum \$31,000, Feb.; Japanese str. Ishin Maru, Grays Harbor to Moji and Yokohama, \$9.10, prompt, J. W. Allen; Japanese str. Rozan Maru, Grays Harbor to Japan, Mar., Yamacho & Co.; Japanese str. Yayoi Maru, Grays Harbor to Japan, Mar., same charterers; Japanese str. Kohnan Maru, Coos Bay and Columbia River to Japan, \$9.50, Mar., Yamashita Co.; Japanese str. Manshu Maru, Columbia River and British Columbia to Japan, \$9.50, Mar., Mitsui & Co.; British str. Hankow Maru, Columbia River to Japan (relet), prompt, Douglas Fir E. & E. Co.; Japanese str. Heiyei Maru No. 7, British Columbia and Columbia River to two ports Japan, \$10.25, less 2½ per cent, Mar., Mitsui & Co.; Japanese str. Clyde Maru, North Pacific to Japan, Mar., Nakagawa & Co.; Japanese str. Taiho Maru, North Pacific to Japan, lumber and logs, Mar.

For lumber to the Atlantic the following steamers are reported fixed: Norwegian str. Hangarland, British Columbia, to North of Hatteras, April; American str. J. R. Gordon, North Pacific to North of Hatteras, Mar., R. R. Sizer Co.; American str. Henry D. Whiton, same, Mar.-Apr.; American str. Maltam, Grays Harbor to New York, \$13.50, Apr.-May; American m.s. East Indien, North Pacific to Boston, Apr., Brady, Ketchum Lum-



Who's Who afloat and ashore

Edited by Jerry Scanlon.



A. P. HAMMOND, vice-president and general manager of the California and Eastern Steamship Company, was recently awarded a verdict for damages amounting to \$60,000 against Niels Nielsen, by United States District Judge McCormick of Los Angeles. The judgment is in three suits directed against the Hammond Steamship Co., Frank C. Hill, and others and has been pending in the courts since early in 1924. The defendants agreed to purchase three freighters, the Luise Nielsen, Hanna Nielsen, and Niels Nielsen, and deposited \$60,000, which was placed in escrow to apply on the purchase price of the freighters. The purchase of the freighters was not consummated, and the plaintiff sought to have the \$60,000 forfeited for contract. In rendering his decision, Judge McCormick quoted in part the language of the California Supreme Court in a previous decision.

"Where the plaintiff was to forfeit the deposit of \$60,000 for the purchase of the steamers without any substantial showing of real damage, would seem to violate all rules of honesty and fair dealing to allow him to take from the defendants the large sum claimed."

The case was handled for the defendants by Attorneys George S. Hupp and Frank C. Hill. The deposit of \$60,000 which was placed in escrow at the time of the deal has been held in an eastern bank, and has been drawing interest from the date of deposit, all of which will come from the plaintiff in the action.

Twenty-two members of the crew of the British tanker *Chuky* arrived in San Francisco aboard the Dollar liner *President Pierce* on March 9. The *Chuky* exploded, broke in two, and sank about 100 miles south of Nojizaki at the entrance to Tokyo Bay, while en route from Los Angeles to Tsumi, Japan. Twenty-six hours after the disaster the survivors were rescued by a Japanese fishing smack and landed at Yokohama, where they boarded the *President Pierce*.

Among the officers and crew who lost their lives were Captain



Chief Engineer J. L. Sheehan of the ill-fated British tanker *Chuky* seems to be none the worse for his narrow escape and long exposure.

Hermes; J. Kellog, first officer; C. Carlson, second officer; J. Rasmussen, third officer; R. Lee, chief steward; John McDonald, oiler; and Alan K. Boyle, fireman.

Among the survivors arriving on the *President Pierce* were Chief Engineer J. L. Sheehan; F. J. Buckley, first assistant engineer; C. C. Herbert, second assistant engineer; B. J. Dreyfus, of San Francisco, oiler; Eugene F. Richie, third assistant engineer; J. L. Leslie, oiler; J. Basque and Joseph Steppany.

Those who lost their lives were killed by the two explosions. The survivors stated the cause was unknown.

W. A. Young Jr., general passenger manager, Panama Mail Steamship Company, is expected to return to San Francisco early this month from New York, after an absence of several weeks conferring with officials of the company on travel plans for the present year.

C. C. Mallory, assistant general manager of the Panama Mail Line, is back in San Francisco after a six weeks tour of inspection of the company's offices in the Spanish Americas.

A. H. Greenquist, electrician aboard the Panama Mail liner *Ecuador*, passed away at sea when that vessel was two days out of New York bound for San Francisco. Greenquist had been in the service of the Panama Mail for more than two years, and was well known and popular with his shipmates. Dr. Metcalf remained at the bedside of the stricken man for forty-eight hours, but he failed to respond to treatment. Greenquist was the sole support of his mother. He was buried at sea in the presence of passengers and crew of the vessel.



Engineers of the Matson Navigation Company liner *Malolo*. Left to right back row: H. T. Keene, first assistant engineer; C. T. McFeely, senior second assistant; R. C. Dwyer, chief engineer; L. B. Kennedy, second assistant; H. D. Jefferson, electrical engineer. Front row left to right: J. F. Murphy, junior second assistant; T. J. Kinslow, third assistant; H. A. Woodruff, third assistant; R. T. Hart, third assistant.

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PLEASE MENTION PACIFIC MARINE REVIEW

A new record for speed in handling a job of major repairs is claimed by Seattle shipping men in the return to the water of the Alaska Steamship Company's liner North-western, which was lifted at Todd's Drydock, Seattle, on February 7, to repair more than 100 bottom plates damaged when the vessel grounded off Cape Mudge last December. Work on the upper structure is nearing an end and the vessel will soon take her place on the Alaska run.

Rate problems have been greatly simplified by the establishment of a west coast headquarters by the United States Intercoastal Conference, in the opinion of H. M. Runyon, Pacific Coast representative. Shippers, consignees, and steamship lines will equally benefit, Runyon told Seattle steamship men on his recent visit here.

Just before his departure from San Francisco for England via New York, Sir Charles Holdsworth, director of the Union Steamship Company, announced that three new ships would be placed on the run between San Francisco and Australia "as soon as they could be supplied." The Niagara, 17,000-ton liner, on the Vancouver-Sydney run, is one of the vessels. Two other liners, now building, also will be placed on the run.

Fifteen millions will be spent by the Matson Line to meet this competition, it is reported, for they plan to build three new liners especially adapted to this trade. From the above announcements it would seem to be a race for supremacy in the trade to Australia out of the port of San Francisco, with steamship men venturing guesses as to which line will be first with the new vessels and service.

James P. Jennings, Seattle lumberman, has taken up his new position as chairman of the newly organized Pacific Coast Lumber Conference at San Francisco. Jennings will act in an advisory capacity to a committee of four representative intercoastal steamship executives—two from proprietary lines and two from so-called commercial lines. This committee will form the rate making body for the lumber trade. Shipping men expect much from this new plan in the way of rate stabilization and regulations advantageous to both shipper and carrier.

W. W. Lense, formerly local district freight manager for the Nippon Yusen Kaisha at Los Angeles, has opened headquarters in San Francisco as general freight agent for the North German Lloyd. The announcement of the change was made in Los Angeles by N.Y.K. headquarters at that port.

Bremen shipping circles report that the North German Lloyd directors favor an eight per cent dividend as compared with last year's six per cent. The larger rate was proposed by the directors at a meeting held on March 26.

James B. Duncan, Oakland representative of the Calmar and Pacific Caribbean Steamship Lines, formerly operating manager of the Black Diamond Steamship Line,



Captain John T. Diggs receiving congratulations on his appointment recently as San Francisco Bay Pilot.

New York, passed away in Oakland, California, recently. Duncan was a very active member of the Oakland Traffic Club, member of the Elks and Masons, and a booster for the port development of Oakland.

Taxation of the earnings of ships documented in Canada have been provided for in the new U. S. Treasury regulations just issued. This is the result of the failure of negotiations with a view to the establishment of a reciprocal agreement to exempt from taxation the earnings of vessels documented in the respective countries.

Ford cargo ships engaged in Pacific and Atlantic services were the subject of a discussion at a meeting of intercoastal agents recently held in Philadelphia and attended by Robert Thackara, chairman of the intercoastal conference. Discussion centered around the activities of the Ford ships, which were reported to be carrying other cargo than Ford products and at a rate far below the conference scale.

American and French bankers have formed a group to offer a large block of French Line securities on the American market. The shares will be in the form of American certificates, as provided in the rules for trading in foreign securities on the principal listed markets of this country. The French Line, which was organized in 1885, owns a fleet of about one hundred vessels.

Frank Allen will manage the new Oriental service of the American-Hawaiian Steamship Lines created by the recent purchase by this line and the Matson Company of the U. S. Shipping Board services out of San Francisco. Walter W. Lense succeeds to the position vacated by Allen, that of freight chief at San Francisco for the North German Lloyd.

The formation of the new Oceanic and Oriental Navigation Company has been completed, according to Roger D. Lapham, president of the American-Hawaiian Steamship Company, which will operate the service in conjunction with the Matson Navigation Company. The sale of the Shipping Board service to private interests represents, in Lapham's opinion, the most hopeful development in years, as far as American merchant marine progress is concerned.

Lapham reported that the intercoastal situation, as far as cargo flow is concerned, is materially improved, the westbound spring movement having already commenced. The conference is still functioning satisfactorily, although there are a number of difficult problems to be met, and not the least of them being the increase in non-conference competition, brought about by the sale of the Ocean Transport Company's steamers to the Dimon interests.

The Matson Navigation Company and the American-Hawaiian Steamship Co. have made a joint bid for the tankers Meton, Dilworth, Stockton, and Salina, each of 10,000 tons deadweight, property of the United States Shipping Board and now being operated in the service between San Francisco, Los Angeles, and Oriental ports.

Late May and early June will witness the addition of two additional vessels in the New York-San Francisco service of the Panama

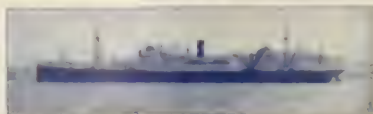
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Mail Line. The vessels are the Santa Ana and Santa Theresa, giving the company a fleet of five vessels in this service on a bi-monthly schedule.

The two liners have been operated in the New York-South American service. They are being replaced by the new Grace Line motorship Santa Maria, and two other new 12,000-ton motorships now nearing completion.

Cape May has been selected as the convention city of the advisory board of the Atlantic Deeper Waterway Association, which will convene for four days, starting September 5.

Britain's national shipping income in 1927 was approximately \$520,000,000, according to figures compiled by Sir Philip Cunliffe-Lister, president of the Board of Trade. He stated that a comprehensive survey showed an average reduction of about 3 per cent in shipping rates in 1927, as compared with 1924.

The Houlder Line, London, controlled by Furness, Withy & Company, report a gross income of \$1,091,955 for the year ending December 31, 1927. The net profit, after providing for all expenses and payment of preference dividend, amounts to \$732,525, compared with \$670,585 in 1926.

A. F. Zipf, Pacific Coast manager of the Williams Line, has announced that, effective late in April, the company will inaugurate a nine-day sailing schedule in the intercoastal trade, instead of the ten-day service maintained since November 1 of last year. Recent purchase of the motorship Seekonk gives the Williams Line a fleet of eleven freighters and makes the new schedule possible. The Williams Line has shown a steady increase in the intercoastal trade. Since January 1, 1927, they have purchased seven additional vessels bringing the original fleet of four up to eleven.

Five Dollar Line freighters operating in the intercoastal trade have been temporarily withdrawn and placed in the American Mail line trade between Seattle and North China, South China, and the Philippines, according to a recent announcement by an official of this company. Pending the acquisition of new tonnage the westbound



Chief Engineer William Hand of the Panama Pacific liner Finland, which was recently sold for scrapping.

freight business will be handled by the President liners in the round-the-world service, which sail every two weeks from Boston and New York for west coast ports. The freighters withdrawn are the Margaret Dollar, Stanley Dollar, Stuart Dollar, Melville Dollar, and Diana Dollar. They were taken off the run to meet the insistent demand of shippers and the Seattle Chamber of Commerce that the American Mail line continue their service to the Orient following the sale of the Shipping Board vessels, for which they were managing operators, to a group of Tacoma business



The "long and short of it" on the Panama Mail liner Ecuador. Charles Tanlund, 5 feet in height, and Thomas Carman, 6 feet, 8 inches.

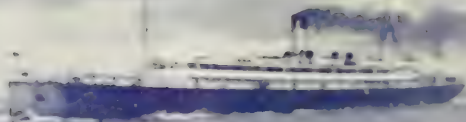
men. When the Dollar Line will resume its intercoastal freight service between Philadelphia, Baltimore, and Norfolk, and Pacific Coast ports is a matter of conjecture.

An interesting experiment in excursions and one being watched with interest is the special trip to Ensenada by the liner Emma Alexander, which will leave Los Angeles harbor on April 20 at 10 p.m. for the Mexican port, arriving there at 2 p.m. the following day. The liner will leave the southern port at 1 p.m. on the 22nd, arriving back at Los Angeles at 6 a.m. on April 23. The American Legion is interested in the venture.

Los Angeles City Council has confirmed the appointment of Emerson Spear to the post of commissioner of the Los Angeles Harbor Board. Spear was named to succeed O. M. Souden, whose resignation was handed in several months ago. Spear, 37 years old, is a graduate of the Massachusetts Institute of Technology, president of the Pacific Wire Products Company, and director of the Pacific National Bank. He is also past president of the Los Angeles Junior Chamber of Commerce, member of the American Society of Mechanical Engineers, American Legion, Shrine, University and Los Angeles Athletic Clubs.

With the completion and turning over of berths 228, D. & E., the Los Angeles Harbor Commission has rearranged dock assignments on Terminal Island. It is proposed that the Dollar Line give up berth 232-A and move its terminal headquarters to Berths 230 D. & E. now occupied by Williams, Dimond & Co. and the General Steamship Corporation. The General Steamship Corporation will move its offices to the present Dollar line docks, while Williams, Dimond & Co. are expected to be assigned to berth 228-D. The Williams Line ships are docking at present at berth 228-E.

One of the recent surprises to the shipping and maritime world was the quick appointment of Captain John T. Diggs, commander of the Matson liner Maui, to the post of San Francisco Bar Pilot left vacant by the death of Captain J. M. Healey. Captain Diggs has an enviable record as a shipmaster. He began his career with the Matson line in 1910 as a quartermaster,



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working his way up to the command of one of the company's largest steamers.

Intensive stability tests will be the rule applied to every San Francisco ferryboat hereafter as a result of the recent Peralta disaster. Dickerson N. Hoover, supervising inspector-general of the United States steamboat service, and Chester Willett, his chief stability inspector, made a special trip from Washington to investigate the Peralta tragedy. The two government officials announce they will again put the Peralta through her paces and also inspect every passenger-carrying bay craft. After a comprehensive survey of the situation a full report of San Francisco Bay passenger carrying vessels will be made.

Major Charles W. Cook, manager of Swayne & Hoyt, Inc., operating the Gulf-Pacific Line, announced that the steamer Neshobee would be renamed the Point Gorda and the Riverside Bridge rechristened Point Arena. The former was purchased for \$33,000 and the latter for \$34,000 from the Shipping Board.

Ray V. Crowder, passenger traffic manager of the Los Angeles Steamship Co., is expected back in San Francisco early this month after a tour of the principal cities of the East. He made the trip for the purpose of discussing plans with executives in New York and Chicago to enlarge the company's offices in these two cities.

Washington advices are to the effect that Brigadier-General Jadwin, chief of the army engineers corps in charge of rivers and harbors, will recommend a channel 35 feet deep and 500 feet wide from Portland to the sea. The present project calls for a 30-foot depth and 300-foot width. Portland shipping interests are awaiting final decision from Washington on the deepening of the channel.

Friends of Perry Otteson, for many years connected with the Admiral Line as chief of the commissary department both in Seattle and San Francisco, are tendering congratulations, following his appointment as port steward for the Matson Navigation Company. The position is the largest of its kind on the Pacific Coast. Otteson succeeded J. R. Harry, veteran Matson

cuisine director, who has retired.

While Henry F. Gelhaus, superintendent engineer for Swayne & Hoyt, is back East supervising reconditioning of the freighters Riverside Bridge and Neshobee, the San Francisco activities will be supervised by Sam Taylor and "Bud" Townsend. The two vessels were purchased for \$33,000 and \$34,000 each from the United States Shipping Board for the Gulf-Pacific Line service of Swayne & Hoyt.

Noel H. Cassell was shifted to the Matson freighter Malama as chief engineer when the vessel went into service. He was formerly on the Mahukona.

Carl Sjolund, formerly chief of



Hugh Gallagher, assistant operating manager of the Matson-Oceanic Line, congratulating Captain J. H. Trask, veteran master of the Steamship Sierra, on his recent return to duty after a severe illness.

the freighter Pawlet, is now occupying the same position on the West Conob. He reports that the new berth is fine.

Henry Ave, well-known in maritime engineering circles, is head of the engineering department of the Los Angeles Steamship Company's freighter Diamond Head. John F. McIntosh is first assistant; Albert S. Haughton, second assistant; and John L. Allen, third assistant.

Wilbur C. Edwards, who served for many years on the liner Rose City as chief engineer, is now holding the same position on the freighter Hollywood.

J. H. Bowen, who sustained serious injuries several months ago in

an automobile accident, has fully recovered and is expected to leave on one of the Matson vessels.

Alex F. Fagerlund left the McCormick freighter Wapama and his place as chief engineer was taken by George H. Clarke.

Andy Wishart, chief engineer of the Admiral Line greyhound H. F. Alexander, despite the fact that the liner has been laid up for several months at the Bethlehem yards at San Francisco, is one of the busiest engineers on the coast. The turbines were taken out of the vessel and reconditioned, and when the vessel is discharged from the drydock she will be like a new ship below decks.

William G. Perow, Port Engineer

SOME fifty years ago a young American boy of Bath, Maine, was learning the trade of marine engineering in the shops there. Later he took to the sea, as most Bath boys do, and with his thorough knowledge of marine engines, soon advanced through the several grades of license until the highest was reached. This in brief is the story of William G. Perow, at this writing port engineer for the Luckenbach Line at San Francisco, with offices on Pier 29.

Mr. Perow came out to this Coast in 1892 as third assistant engineer of the steamship Satur, and was employed on different steamers out of the port of San Francisco and on the East Coast, joining the Luckenbach Company twelve years ago as chief. He looked after the construction of the steamship Walter Luckenbach at Seattle, and at the outbreak of the World War joined the U.S. Navy Reserves, being detailed as Chief Engineer Officer of the steamer built under his supervision. While in this position the vessel whose engines he cared for made most remarkable records in transatlantic runs. In one instance she carried troops from Newport News to France, discharged her living cargo, and thousands of tons of freight, returning to port of departure in the remarkable time of fourteen days. On this voyage she made an average speed of over fifteen knots, although built for fourteen.

Mr. Perow at the close of the war took up shore duty, and is now guarding the marine engineering interests of the Luckenbach Line.



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Book Reviews

SHIP MODEL MAKING. VOLUME III. by E. Armitage McCann. How to Make a Model of the U. S. Frigate Constitution. 200 pages; 109 illustrations and 2 large plans; bound in blue buckram with gold stampings and having a colored frontispiece, published by The Norman W. Henley Publishing Co., 2 West 45th Street, New York. Price \$2.50.

This third book of a series by Captain McCann on model making is fully up to the standard set by the other two. Several of the early models of the U.S. frigate Constitution are fully illustrated and explained. All the details of the ship are set forth in easily understandable tracings, and full explanations are given for figuring materials and for fastening the various parts of the ship to make a finished and fascinating facsimile of this famous frigate.

IN THE WAKE OF THE WIND-SHIPS. by Frederick William Wallace. 280 pages; profusely illustrated, bound in green buckram; published by George Sully and Company, New York.

This book contains many notes and records and biographical material pertaining to the square rigged merchant ships of British North America and to the men who officered those ships. This is a companion volume to "Wooden Ships and Iron Men," really an extension of that story and an elaboration of the shipbuilding and seafaring ventures of the "Blue Nose" skipper of Eastern Canada.

There are 237 illustrations, and the book forms, with these pictures, a very real contribution to a chapter in the story of the world's merchant marine which has been ignored largely by the nautical historian. Frederick William Wallace knows this story intimately through personal contact with many of the veteran Canadian seamen, and he tells it in a very spirited and masterly way.

PACIFIC STEAMERS. The History, Rise and Development of Steamers on the Australian, New Zealand, and Western American Coasts, by Will Lawson. 245 pages; profusely illustrated; bound in dark blue buckram with gold stampings; published by Brown, Son & Ferguson, Ltd., Glasgow, Scotland. Price 16 shillings, net.

In this story, dedicated to "All old Steamer-Men," Will Lawson tells of the beginnings of steamship service in the Pacific and brings that story almost up to date. The book is modern enough to picture and describe the Aorangi and

the Malolo, and runs back 100 years to the time when the small Spanish steamer Telica startled the echoes of the Pacific and introduced steam navigation by blowing up her boilers on the west coast of South America in 1828.

Any one interested in the history of navigation on the Pacific will find in this book a very interesting chapter of that fascinating subject.

THE SAILING-SHIP. by Romola and R. C. Anderson. 210 pages, with 20 full page plates and 134 drawings scattered through the text; bound in blue buckram with gold stampings; published by Robert M. McBride & Company, New York.

This is a charmingly sketchy little volume, treating of the development of navigation by wind power over a period covering 6000 years of maritime history. The drawings scattered through the text are largely reproductions of ancient designs found on jewelry, on stone monuments, on old tapestries, and on stained glass, coins, and medals.

PHYSICS IN INDUSTRY. Volume V, published by Humphrey Milford, Oxford University Press, London and New York.

The series, Physics in Industry, is the record of a group of lectures delivered before the Institute of Physics in London. Volume V of this series is of particular interest to readers of Pacific Marine Review in that it comprises "Lecture X. The Relation of Physics to Aeronautical Science," by H. E. Wimperis, director of Scientific Research, British Air Ministry," and "Lecture XI, Physics in Navigation," by F. E. Smith, Director of Scientific Research, British Admiralty."

The lecture on Physics in Aeronautical Science touches a few of the high spots in research into phenomena in the navigation of heavier than air machines and their propulsion machinery.

Mr. Smith, in the lecture on Physics in Navigation, covers an intensely interesting excursion into the history of navigation and its debt to the science of physics, covering the first application of the mechanical compass down through the introduction of the sextant, accurate chronometers, the gyro-compass, logs, and sounding mechanisms. Then he takes up the present-day work in connection with

position finding, directional wireless, leader cables, duplex fog signals, and the work of the International Ice Patrol in connection with the studies of drifting ice and icebergs.

MARINE BORERS AND THEIR RELATION TO MARINE CONSTRUCTION ON THE PACIFIC COAST. Final report of the San Francisco Bay Marine Piling Committee, edited by C. L. Hill and C. A. Kofoid; published by the Committee at San Francisco and for sale by the University of California Press, Berkeley, California.

The San Francisco Bay Marine Piling Committee was appointed on December 22, 1920, as a direct result of the tremendous damage done between 1917 and the latter part of 1919 to much of the lumber piling, wharves, and waterfront structures in upper San Francisco Bay. This Committee was adequately financed, and included some of the more capable experts in biographical research, dock engineering, mechanical engineering, and the various affiliated line of state and practical endeavor.

After considerable study and research work, the Committee came to certain conclusions with regard to waterfront structures and the safety thereof as affected by conditions in San Francisco Bay and vicinity. Specifications for treatment of Douglas fir piling and lumber for use in marine structures and specifications on concrete work of various classes have been compiled and form part of this final report.

The Biographical Section, compiled under the direction of Professor Charles A. Kofoid of the University of California, is a complete and very exhaustive study of the ship worms of the Pacific Coast and its islands.

The Engineering Section, edited by R. M. Neilly and W. H. Kirkbride, furnishes any civil engineer with all of the information necessary to adapt the design of his pier, warehouse, or sea wall to the peculiar chemical and biographical factors existing in San Francisco Bay.

The Hydrographic Section, by C. E. Grunsky, is a masterpiece of terse, epigrammatic English, describing in detail the geography of San Francisco Bay and its tributary waters.

Altogether, this report makes a very worthwhile volume, and

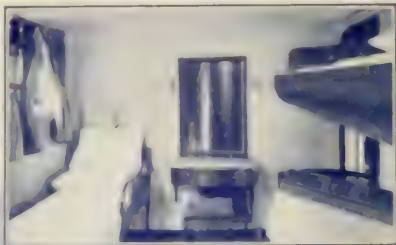
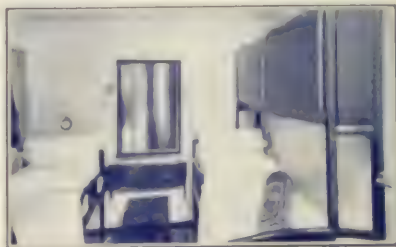
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PORT SERIES NO. 12, a report prepared by the Board of Engineers for Rivers and Harbors of the U.S. War Department in collaboration with the United States Shipping Board, covering the ports of San Francisco, Oakland, Berkeley, Richmond, Upper San Francisco Bay, Santa Cruz and Monterey. Published by Government Printing Office, Washington, D.C. Price 51.

This report shows San Francisco Bay to be one of the finest harbors in the world. That in 1925 the total freight tonnage passing in and out of the Golden Gate was 27,995,000 tons, making this channel third in importance among the approaches to salt water ports in the United States, being only exceeded by the approach to New York Har-

bor and the approach to Chesapeake Bay.

According to this report, San Francisco handled 51 per cent of all of the imports and exports on the Pacific Coast. The report shows Oakland's water-borne commerce growing very rapidly, having had 2,767,000 tons of water-borne commerce in 1925.

THE ORIGIN OF THE RIGHT OF FISHERY IN TERRITORIAL WATERS, by Percy Thomas Fenn, Jr., 245 pages; bound in red buckram with gold stampings; published by Harvard University Press, Cambridge, Mass.

Mr. Fenn is assistant professor of political science in Washington University, St. Louis. His book covers a very scholarly piece of research into the history of the rise of legal theory of fishery rights and sovereignty over territorial sea waters.

engineering data and information of value to those engaged in the design and operation of steam driven vessels, naval architects, marine engineers, and others.

Bureau of Fisheries, Department of Commerce, has issued a booklet on **Fishery Industries of United States, 1926**, prepared by Oscar E. Sette. This is document NO. 1025, and may be obtained from the Government Printing Office, Washington, D.C., for 25 cents.

Hough & Egbert, San Francisco representatives for Walter Kidde & Company of New York, have recently sent us two interesting leaflets. One is entitled "What They Say —" and gives a few graphic reports of the advantages of the installation of **Lux** fire extinguishing systems on yachts and other small boats. The other is a catalog-leaflet covering this equipment and contains specifications for various applications and prices of the complete installations.

Trade Literature

American Marine Standards Committee has compiled data and has available for distribution through the Government Printing Office or any office of the Department of Commerce the following specifications and standards and general information of great importance to ship and engine builders and designers, to ship operators and engineers, and to supply manufacturers:

Fire-Clay Refractories for Marine Service (AMSC 32).

Packing Gland for Propeller Hubs (AMSC 31).

Propeller Hub Studs, Nuts, and Lock Screws (AMSC 30).

Ship Propeller Details (Hubs for built-up propellers with recessed blades; fair-water caps for built-up propellers with recessed blades) (AMSC 29).

Couplings for Propeller Shafting (Flanged couplings; loose couplings for inboard shafts) (AMSC 27).

Propeller Shaft Details (tail shafts and stern tube bearings; propeller keys; propeller nuts; stern tube stuffing boxes) (AMSC 28).

Pilot Ladder (AMSC 25).

Fire Hose Racks for Ships (Metal rack, pocket type; metal rack, saddle type; wooden rack) (AMSC 24).

Tubular Steel Cargo Booms for Ships (Capacities of 5, 10, 15, 20, and 30 tons) (AMSC 26).

Port of New Orleans have issued their **Thirty-First Report**. The Port of New Orleans is an agency of the State of Louisiana and is the second port in volume of shipping in the United States.

This port has also gained a very high reputation for efficiency and economy of operation, and a study of its annual report should be of great benefit to those interested in port development and port operation.

The **Babcock & Wilcox Co.**, manufacturer of water-tube steam boilers, has recently published a third edition of its book "**Marine Steam**." Several chapters of this book are devoted to a description of the different designs of Babcock & Wilcox marine boilers, oil burners, and other equipment, the greater number of chapters containing much marine steam engin-

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Pilbrico Jointless Firebrick Co.
- Oakum.**
Ford-Bartow Ship Chandlery Co.
Geo. Crawford Oatum Co.
Weeks-Howe-Emerson Company.
- Oil.**
(See Lubricants.)
- Oil Burners.**
Coe Company.
Bethlehem S. B. Corp., Ltd.
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Standard Specialties Co.
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Federal Comp. & Paint Co., Ltd.
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Hill-Hubbell Co.
International Compositions Co.
Waxes-Dove-Hermiston Corporation.
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L. W. Ferdinand & Company.
Hill-Hubbell Co.
International Compositions Company.
- Paint, Waterproof.**
American Asphalt Paint Co.
L. W. Ferdinand & Company.
Hill-Hubbell Co.
International Compositions Company.
- Paneling.**
Ford & Geirne.
Haskette Mfg. Corporation.
The Pantostone Company, Inc.
- Phosphor Bronze Castings.**
The William Cramp & Sons Ship & Engine Building Co.
Griscum-Russell Company.
Hyde Windlass Company.
- Pipe Unions.**
The Lunkenheimer Company.
William Powell Company.
- Pipe Wrenches.**
Greene-Tweed & Company.
- Pipe, Welded.**
American Welding Company.
- Propellers.**
Bethlehem S. B. Corp., Ltd.
Cleveland Propeller Co.
The William Cramp & Sons Ship & Engine Building Co.
Hyde Windlass Company.
Kearfoot Engineering Co., Inc.
Moore Dry Dock Company.
- Propellers, Bronze, Iron and Steel.**
The William Cramp & Sons Ship & Engine Building Co.
- Propeller Wheels, Hubs and Blades.**
- The William Cramp & Sons Ship & Engine Building Co.**
- Presses.**
(See Forging Presses.)
- Propeller Shaft Sleeves.**
Kearfoot Engineering Company.
The William Cramp & Sons Ship & Engine Building Co.
- Pumps.**
Davis Engineering Corporation.
Fairbanks, Morse & Co.
Ford & Geirne.
Griscum-Russell Company.
Hyde Windlass Company.
Ingersoll-Rand Co.
Kearfoot Engineering Co., Inc.
National Transit Pump & M. Co.
Northern Pump Company.
Western Engineering Company.
Worthington P. & M. Corp.
- Pumps, Ballast.**
Ingersoll-Rand Co.
National Transit Pump & Machine Co.
Northern Pump Company.
Warren Steam Pump Co.
Western Engineering Company.
Worthington Pump & Machinery Corporation.
- Pumps, Bilge.**
Ingersoll-Rand Co.
Northern Pump Company.
Warren Steam Pump Co.
Western Engineering Company.
Worthington Pump & Machinery Corporation.
- Pumps, Boiler Feed.**
Ingersoll-Rand Co.
National Transit Pump & Machine Co.
Western Engineering Company.
Worthington Pump & Machinery Corporation.
- Pumps, Centrifugal.**
Ingersoll-Rand Co.
Worthington Pump & Machinery Corporation.
- Pumps, Circulating.**
Ingersoll-Rand Co.
Northern Pump Company.
Viking Pump Co.
Worthington Pump & Machinery Corporation.
- Pumps, Deck.**
Ingersoll-Rand Co.
Northern Pump Company.
Viking Pump Co.
Worthington Pump & Machinery Corporation.
- Pumps, Electric.**
Ingersoll-Rand Co.
Warren Steam Pump Co.
Western Engineering Company.
Worthington Pump & Machinery Corporation.
- Pumps, Electric-driven.**
Ingersoll-Rand Co.
Northern Pump Company.
Viking Pump Co.
Worthington Pump & Machinery Corporation.
- Pumps, Fuel Oil.**
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
National Transit Pump & Machine Co.
Northern Pump Company.
Vaughn, G. E. Witt Co.
Viking Pump Co.
Western Engineering Company.
Worthington Pump & Machinery Corporation.
- Pumps, Gasoline.**
Page Brothers.
Bethlehem S. B. Corp., Ltd.
Moore Dry Dock Company.
- Ship and Boat Builders.**
Bethlehem S. B. Corp., Ltd.
Federal Shipbuilding Company.
Los Angeles S. B. & D. D. Co.
Moore Dry Dock Company.
Sun Shipbuilding Co.
Todd Dry Dock Corporation.
- Ship Bottom Paint.**
American Asphalt Paint Co.
Federal Comp. & Paint Co., Inc.
General Electric Company.
- Ship Construction Systems.**
J. W. Ibberson.
- Ship Lighting.**
(See Electric Fittings and Supplies.)
- Ship Chandlers.**
(See Hardware and Ship Chandlery.)
- Ship Telephones (Wireless or Intercommunicating).**
Chas. Corry & Son, Inc.
- Spring.**
The Simmons Company.
- Steam Drums.**
American Welding Company.
- Northern Pump Company.**
The Sperry Gyroscope Company.
Worthington Pump & Machinery Corporation.
- Purse Seines.**
Cunningham, Allan.
- Purifiers.**
Ford & Geirne.
- Push Buttons.**
Chas. Corry & Son, Inc.
- Radial Drills.**
Cleveland P. & S. Works Co.
- Radio Apparatus.**
Eas-Holm & Galvan.
Federal Telegraph Company.
Radio Corporation of America.
- Radio Direction Finders.**
Federal Telegraph Co.
Radio Corporation of America.
- Receptacles (Electric).**
Chas. Corry & Son, Inc.
- Reducing Gears.**
(See Gear.)
- Refined Oils.**
Associated Oil Company.
Standard Oil Company.
- Refrigerating Machinery.**
(See Ice Machines.)
- Regulators (Pressure).**
Foster Engineering Company.
Vaughn, G. E. Witt Co.
- Riggers.**
Havside Company.
Smith-Rice Company.
- Rivets.**
C. W. Fisher.
- Roofing Paints.**
L. W. Ferdinand & Company.
- Rope.**
(See also Wire Rope.)
Columbian Rope Company.
Durable Wire Rope Company.
Griscum-Russell Company.
Guy F. Slaughter & Co.
- Rudder Angle-Indicator.**
Chas. Corry & Son, Inc.
The Sperry Gyroscope Co.
- Running Lights.**
Chas. Corry & Son, Inc.
- Running Light Panels.**
Chas. Corry & Son, Inc.
General Electric Company.
- Sails.**
Havside Company.
(See Hardware and Ship Chandlery.)
- Scuttle Butts.**
Brunswick-Kroeschell Co.
Frick Company.
- Searchlight Control Gear.**
The Sperry Gyroscope Company.
- Searchlight, High Intensity.**
General Electric Company.
The Sperry Gyroscope Company.
- Searchlights (Low Intensity).**
Eas-Holm & Galvan.
General Electric Company.
- Separators (Steam, Air and Oil).**
Griscum-Russell Company.
The Babcock & Wilcox Co.
William Powell Company.
- Shafting (Forged Steel).**
Kearfoot Engineering Company.
- Shear Blades.**
Geo. F. Marchant Company.
- Ship Agents and Brokers.**
Page Brothers.
Bethlehem S. B. Corp., Ltd.
Moore Dry Dock Company.
- Ship and Boat Builders.**
Bethlehem S. B. Corp., Ltd.
Federal Shipbuilding Company.
Los Angeles S. B. & D. D. Co.
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(See Electric Fittings and Supplies.)
- Ship Chandlers.**
(See Hardware and Ship Chandlery.)
- Ship Telephones (Wireless or Intercommunicating).**
Chas. Corry & Son, Inc.
- Spring.**
The Simmons Company.
- Steam Drums.**
American Welding Company.

Oil-Electric Locomotives

THE American Electric Motor Company and the General Electric Company, early early combined an electric locomotive for the following service. In their new The General Electric Company will use the electric locomotive, General Electric, as the motor for the first test run. The American Rolling Mill Company will put the new electric locomotive into service on its plant in Portland, Oregon. The electric locomotive is being constructed by the American Rolling Mill Company, and the electric motor is being constructed by the American Electric Motor Company. The electric locomotive is being constructed by the American Electric Motor Company, and the electric motor is being constructed by the American Electric Motor Company.

The electric locomotive, built by the American Electric Motor Company, will be used for the following service. In their new The General Electric Company will use the electric locomotive, General Electric, as the motor for the first test run. The American Rolling Mill Company will put the new electric locomotive into service on its plant in Portland, Oregon. The electric locomotive is being constructed by the American Rolling Mill Company, and the electric motor is being constructed by the American Electric Motor Company.

in fact, were the only ones to be used in the service.

The electric locomotive is constructed with a motor for each of the four wheels, and is built with a motor for each of the four wheels. The electric locomotive is built with a motor for each of the four wheels, and is built with a motor for each of the four wheels. The electric locomotive is built with a motor for each of the four wheels, and is built with a motor for each of the four wheels.

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A Capable Chain Block

THE principal factor in a chain block is the chain. The chain is the principal factor in a chain block. The chain is the principal factor in a chain block. The chain is the principal factor in a chain block.

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Washington-Estep on Astoria Ferry

Washington-Estep, a new ferry, is being built by the Washington-Estep Ferry Company. The ferry is being built by the Washington-Estep Ferry Company. The ferry is being built by the Washington-Estep Ferry Company. The ferry is being built by the Washington-Estep Ferry Company.

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Washington-Estep direct reversing type marine full diesel.

Pacific Marine Review

The National Magazine of Shipping

May, 1928

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Marine Paints and Varnishes

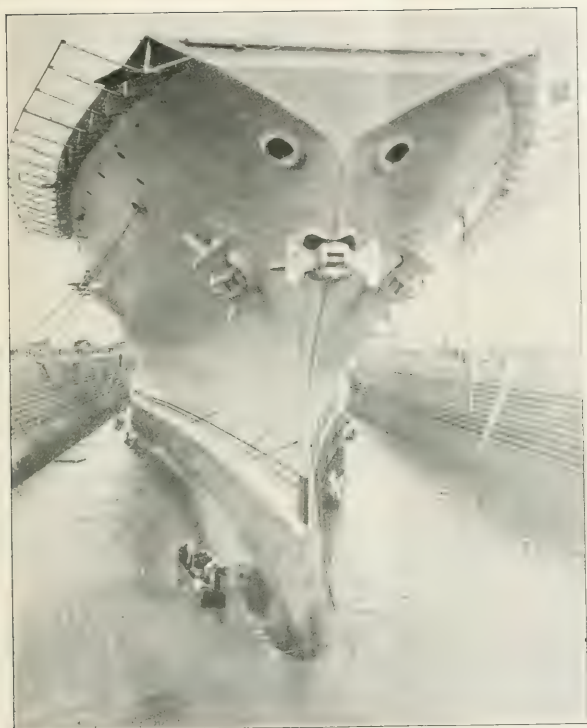
LOS ANGELES
NEW YORK

NON-FLUORESCENT
FATTY ACIDS

210

NOTES
ON THE

Some Users



*U. S. Airplane Carrier Lexington
in Hunters Point Dry Dock
San Francisco*

THE Hunters Point Dry Dock of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., was, when built in 1915, the largest commercial graving dock in the world and is today the largest in continental United States. It is a matter of great pride to ship-minded San Franciscans that equipment is maintained in their port ready to take care of the largest ships afloat.



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Pacific Marine Review

The National Magazine of Shipping



Official Organ
Pacific American Steamship
Association

James S. Hines,
President and Publisher

Bernard N. De Roehie,
Vice President and Manager

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

American Merchant Marine Fundamentals The Handicaps, the Advantages, and Some Suggestions For Improvement

By Norman T. Titus, *

Chief, Transportation Division, Bureau of Foreign and Domestic Commerce.

RECENT investigations by the Shipping Board and the National Council of American Shipbuilders reveal, in considerable detail, the excessive cost of building ships in American yards under present conditions. The Shipping Board's conclusions indicate that the cost of constructing vessels in American yards ranges, in accordance with the type of vessel, from 33 to 40 per cent higher than in British yards. The National Council of American Shipbuilders found that American costs were higher than British costs by 54 per cent to 60 per cent, according to the size and type of vessel. For example, a 10,000-ton freighter built in American yards would cost \$1,250,000, but if built in British yards the cost would be only \$800,000. Thus the American cost would be \$450,000 more than the British. With interest at 6 per cent, depreciation 5 per cent, insurance 5 per cent, and repairs 2 per cent, the capital charges of 18 per cent on \$450,000, the excess American cost would be \$81,000 per year. In other words, such an American-built vessel would have to earn \$81,000 before it would begin to compete with the British-built vessel on an operating basis.

The wage cost of a large number of American vessels, compared with an equal number of foreign vessels of similar types, was found to average about 49 per cent higher. The subsistence cost of crews on American vessels was found to be greater by an average of 32 per cent. A further handicap is that cargo insurance on American vessels, in many cases, is higher than on foreign vessels.

When we consider the national advantages flowing from a merchant marine we find:

1. The creation of a maritime prestige commensurate with the nation's wealth and resources would result in a greater appreciation, by all nations, of American sea power and trade supremacy.

2. A merchant marine is a most effective form of

advertising, and, thereby, would advance the interests of our foreign trade.

3. Unquestionably, an American marine would have a beneficial effect on ocean freight rates.

4. Our own merchant marine would foster new and improved liner services, thus aiding and assisting our foreign trade.

5. An American merchant marine keeps our dollars at home. Our maritime freight bill for the fiscal year 1926-27 was \$760,000,000, of which American vessels earned only \$228,000,000.

6. In times of national emergency, due to strikes or wars abroad, an American merchant marine would tend not only to stabilize rates, but also to assure space for our exporters and importers.

7. In controversial issues an American line with accessible headquarters in this country could be counted on for fairer and more equitable treatment to its patrons than a foreign line.

8. An American merchant marine may be reckoned to be of infinitely more value than foreign ships when it comes to development work in a pioneering trade. American owners would be much more willing to carry on an unprofitable trade, with anticipation of ultimate profitable operation.

Americans generally are practically unanimous for a merchant marine. In striking the balance between the adverse and the favorable factors, the sentiment throughout the country, as disclosed in the Shipping Board's 33 regional hearings and 9000 questionnaires, indicated that Americans generally believe the advantages outweigh the disadvantages. The problem, as commonly stated, concerns the method of overcoming the handicaps and firmly establishing our merchant fleet to meet world competition.

In the allied transportation field of railroading, a veritable revolution has taken place in the last five or six years. American railroads have achieved remarkable results in the improvement of their operations.

*Abstract of Address before Fifteenth National Foreign Trade Convention, Houston, Texas, April 27, 1928.

More Motorships Needed

ONE outstanding difference between the American merchant marine fleet and the merchant marine fleets of all other countries is the lack in the American fleet of modern economical motorships. By the end of 1928 there will be 500 foreign modern motorships competing with America's obsolete steamers, and if this condition continues there can be only one outcome—the American steamer will not be able to compete in foreign trade.

The United States Shipping Board has owned and controlled 2536 vessels aggregating 14,706,217 deadweight tons. Since 1921 the Shipping Board has sold to American citizens 1134 ships, of 4,993,346 tons, for \$84,411,923.39. As of June 30, 1927, the Board still possesses 823 ships, 307 in active operation and 516 in the laid-up fleet. Among this remaining fleet are some of the best hulls, and many of these ships have never been to sea.

This American war-built commercial fleet presented a menace to foreign shipping which has probably forwarded the rapid building of motorships in Europe since the war.

According to Lloyd's Register of Shipping (Annual Report 1926-1927), in July, 1919 there were recorded in Lloyd's Register Book only 912 motorships of a total of 752,000 gross tons. In July, 1927, this number had increased to 2552 motorships, 4,270,824 gross tons, including all motorships of 100 tons and over. The current Lloyd's Register Book contains particulars of 241 motorships of over 6000 tons each, aggregating 2,024,958 tons gross.

As of July, 1927, 297 motorships of over 1000 tons deadweight capacity, equivalent to approximately 1,860,000 tons gross, were on order throughout the world.

The menace of this rapid adoption of motorships by foreign ship owners is disclosed by the following list of 28 ship owners having 279 motorships completed or on order, of which shipping companies, 22 owned no motorships prior to 1919.

OWNERS	DATE OF FIRST MOTORSHIP	STEAMERS SINCE BUILT OR ORDERED	MOTORSHIPS COMPLETED OR ON ORDER
East Asiatic Co.	1914	0	10
A. B. Nordstjernman	1912	0	10
Clausen Lines	1914	2	10
Glen Line	1910	0	10
Transatlantic S.S. Co.	1918	0	10
Brostrom Lines	1910	0	10
Pacific S.S. Co.	1910	0	10
Bergen S.S. Co.	1911	0	10
A. P. Koller	1911	0	10
Grangesberg Caisson Co.	1911	0	10
Lempert and Holt	1911	0	10
Elder, Dempster and Co.	1921	0	10
Wilhelmsen	1921	0	10
Farness Lines	1921	0	10
Royal Mail S.P. Co.	1921	0	10
Alfred Holt and Co.	1912	0	10
Netherland S.S. Co.	1923	0	10
Silver Line	1911	0	10
Bank Line	1911	0	10
H. C. Horn	1911	0	10
Landsverk & Linsen	1911	0	10
Aspen Yacht & Ship Co.	1911	0	10
A. B. Borgestad	1921	0	10
Fearnley and Soper	1911	0	10
Christensen Smith & Soder ..	1911	0	10
Ivar Aas & Christensen	1911	0	10
Klavenseth and Co.	1911	0	10
Commerceland and Dominion Line ..	1911	0	10
TOTALS		12	10

In comparison with this, we find that the authorized program will provide the United States Shipping Board with less than 30 motorships by the end of 1928.

The only way to supply this necessary fleet of several hundred American motorships in time to meet this foreign competition is to extend the present work of converting the existing slow-speed, inefficient steamers to higher speed, economical motorships.

The Shipping Board should undertake all this work of motorization along strictly commercial lines and get rid of the notion that the marine diesel engine is still an experiment.

There is no need of extra-commercial-standard specifications on tests. There is need of common sense.

The work should be done on one bid (covering both propulsion machinery and installation per lot of, say 10, steamers) from the shipbuilding firms competent to make good on the ordinary shipbuilder's guarantees, i.e., stated fully loaded speed on stated maximum fuel consumption. The Shipping Board should leave much of its present burdensome inspection to the American Bureau of Shipping and the Steamboat Inspection Service, but should see that competent marine operating engineers work through the plants both with the engine builders and with the shipyards and that these men then go out with the resulting motorships as engine room personnel. A common sense program of this sort would greatly reduce the present very high cost of conversion.

Given such a program it is entirely within the capacity of our American shipbuilding and engine building plant to turn out 200 modern seagoing motor freight liners before the end of 1930.

It is submitted that such an achievement would greatly help to put the American merchant marine on a more even competitive basis.

Shipyard Depreciation Committee

RECOGNIZING the importance of standardizing the rates of depreciation and methods of applying them, the National Council of American Shipbuilders is cooperating with the Bureau of Internal Revenue to simplify and standardize the preparation and audit of shipyard tax returns involving deductions for depreciation of shipyard plant and equipment. For this purpose a committee has been appointed consisting of H. G. Smith of Bethlehem Shipbuilding Corporation and George H. Bates of Staten Island Shipbuilding Co. The committee is now making a study of plant depreciation, the special factors entering into it arising from war conditions, and the methods observed by various yards in charging off depreciation. Upon completion of its survey, the committee will recommend for adoption by the Bureau standard depreciation rates and methods for use by shipyards in the preparation of subsequent tax returns.



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A Commensurate American Merchant Marine

Fast Cargo and Passenger Liners are Indispensable Factors for the Adequate Expansion of American Foreign Trade and for the Insurance of National Security

By Alfred H. Haag

Director, Department International Shipping, Georgetown University School of Foreign Service

PROBABLY the most vital issue confronting the American people today is the much-discussed shipping problem. American ships of commerce are an economic necessity and an indispensable factor as an auxiliary to our Navy in times of national emergency.

It is inconceivable that the richest nation in the world, with a wealth of \$400,000,000,000, and an international trade of almost \$10,000,000,000 annually, with freight revenues for transporting this trade amounting to \$600,000,000 per annum, cannot support a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce. The fact is that to-day 70 per cent of our international trade is carried in foreign-flag ships.

Flag-waving arguments have no effect in influencing American shippers to use American-flag ships and will have none until such time as our flag waves from the ensign staff of a ship offering the same advantages in speed, regularity, and frequency of sailings as that offered by our competitors. Not until that time can we be assured of the full support of American shippers; nor is it fair or reasonable for us to expect them to accept inferior commercial service under the guise of patriotism.

The postwar trend has been toward cargo-liner service—that is, a port to port service—in contradistinction to tramp service; and this service now represents 75 per cent of the world's merchant tonnage. Our competitors were quick to recognize this trend and have either built or acquired modern tonnage with increased speeds and other economic advantages, so that today we are far behind in this respect.

During the period from 1921 to 1926, the principal maritime nations built for transoceanic service vessels

of 2000 gross tons and over, totaling approximately as follows:

Country	Vessels	Gross tons
Great Britain	600	3,500,000
Germany	172	950,000
Italy	63	506,000
France	72	450,000
Japan	52	250,000
United States	14	137,000
Total	973	5,793,000

Or for every single ship of this class that the United States has built Great Britain has approximately 42, Germany 12, France 5, Italy 4, and Japan 4.

Of ships building or contracted for at the present time, of the same class and service, the records disclose the following:

Country	Vessels	Gross tons
Great Britain	142	980,000
Germany	49	395,000
Italy	28	300,000
Japan	19	100,000
United States	4	63,000
France	8	58,000

Total 250 1,896,000
Or for every single ship of this class that the United States is building or has contracted for at the present time Great Britain has 35, Germany 12, Italy 7, Japan 5, and France 2.

Another striking comparison is in the number and speed of vessels, suitable for transoceanic service, registered under the flag of the principal maritime nations.

(Continued on Page 207)



Both our Pacific and Atlantic foreign trade services could use many more liners of the class of the Malolo, shown above.

fire-proof bulkheads. Agreement was also reached on the main considerations governing the survey of ships, it being left to the various nations concerned to draw up detailed regulations in accordance with these general principles, to communicate the regulations to each of the other contracting states, and to secure their enforcement. The question of subdivision, affecting, as it did, the structural and general arrangements of all passenger ships, was one of the most important subjects before the conference. The regulations laid down standards of subdivision expressed by two distinct tables of factors of subdivision: (B) For a cargo ship principally engaged in the carriage of freight but carrying a few passengers and (C) for a first-class passenger ship carrying comparatively little cargo, such that the highest degree of safety corresponded with the ships of greatest length primarily engaged in the carriage of passengers. The standard of subdivision for ships between these two definite types was to depend on a certain "criterion of service," and the study of this very complicated question was left for further consideration, the British Government undertaking the duty of circulating information received from the various governments. It is well known that the proposed standards of subdivision, including the involved question of the criterion of service, have given rise to considerable controversy and been under fire from British shipping interests, who claimed that the standard required for the cargo ship carrying relatively few passengers was altogether too high and would tend to put this type of ship out of business. This question has since been thrashed out by various British Bulkhead Committees, and the latest British proposals go far to meet the proper objections of the owners of "intermediate" type vessels.

Radio-Telegraphy

The convention required all merchant ships, whether carrying passengers or not, to be fitted with radio telegraph installations on overseas voyages if they had on board fifty or more persons. The convention also specified the types and service of the ships which were required to maintain a continuous watch during navigation and outlined the duties of the master of the ship receiving a call for assistance from a ship in distress. Since the date of the convention there has been a remarkable advance in radio telegraphy, and most maritime nations now require all seagoing ships to be fitted with radio apparatus.

Life-Saving Appliances and Fire Protection

This section of the convention dealt primarily with lifeboats and pontoon rafts, including equipment and stowage, and laid down for the first time the principle that at no time during a voyage may a ship have on board a total number of persons greater than that for whom accommodation is provided in the life boats and the pontoon rafts on board. Most of the governments concerned have since adopted regulations in general agreement with the convention, with the result that the modern passenger ship is loaded up with lifeboats and equipment which may or may not be of use in cases of emergency, depending on existing weather conditions.

Safety Certificates

The convention provided for the issue of special Safety Certificates to passenger ships which after inspection and survey were found to comply with the

requirements of the convention. These safety certificates were to be mutually acceptable, i.e., a certificate issued under the authority of any contracting state would be accepted by the governments of the other contracting states for all purposes covered by the convention. Safety certificates were to be issued annually after inspection by the regular government officials or alternatively by the surveyors of any organization duly recognized by the government, but in any case the state to which the ship belonged was to assume full responsibility for any certificate issued. Ships in foreign ports were to be subject to casual survey by the proper officials in order to verify that the conditions of the vessel's seaworthiness corresponded with the particulars of the safety certificate carried aboard. It was also agreed, where the subdivision, etc., was in excess of the convention requirements, that the fact should be noted on the vessel's safety certificate, a very proper proviso, as due credit should be given to the owner who goes to the additional expense of building his ship in excess of the standard requirements.

The question of International Freeboard Regulations was not discussed at the conference in view of the expressed intention of the British Government to call a special conference for the discussion of the load line question at some later date.

Since the date of the last conference conditions have changed considerably, very valuable experience having been gained in the working of the Convention Regulations in all the maritime countries, and it is now generally admitted that if there is to be an international standard, changes in the Convention of 1914 will be necessary. Compliance with convention requirements has meant a considerable increase in construction costs, and economic considerations alone would make one hesitate to suggest a relatively higher legal safety standard for American passenger ships. Enlightened public opinion will, however, demand that American passenger ships be provided with subdivision, safety appliances, etc., at least as effective as the ships of other maritime nations. Emphasis must also be placed upon the fact that subdivision regulations and stability regulations are worthless unless means are taken to insure that ships in service are not loaded beyond their maximum designed drafts. Acceptance by this country of any international regulations for the safety of life at sea will therefore be in effect acceptance of the principle of a compulsory load line for all ocean-going vessels, and this fact constitutes another sound reason why the load line bill should be passed by Congress at the earliest possible date.

There is a large measure of truth in the oft-quoted phrase, "He regulates best who regulates least," and it is somewhat difficult for the shipping interests of this country to work up any enthusiasm for regulations which will necessarily have the force of law. No government can afford to evade the issue where the lives of its citizens are concerned, and the survey of vessels carrying passengers for hire is therefore very properly a governmental function. What ship owners and builders are entitled to expect is that regulations be kept to a minimum and that they be equitably and impartially administered. It is vital to the interests of our merchant marine that the United States be efficiently and sufficiently represented at the coming conference.

—American Bureau of Shipping-Bulletin.

ter give rules for the proportions of rivets and their distribution throughout the ship in various members. They agree on the proportions of manufactured rivets, or rivets before being driven.

Let "d" represent the diameter of the rivet. The diameter of the head is 1.6 d. Diameter of swell neck is 1.12 d; thickness of head .7 d; diameter of driven rivet $D = d + 1/16$ inch.

The dimensions of countersunk rivets vary somewhat and these variations are best shown by a comparative table compiled from the interpretation of the rules of each society. The American Bureau Rules require diameter of countersunks to be in accordance with Table 16, pages 346-347; and the depth of countersunk is quoted from rules paragraph 5, page 69, as follows: "Countersunks are to have the face diameter given in Table 16; the countersink is to extend through the plate where the thickness is under 0.60 inch and through at least 90 per cent of the thickness where it is 0.60-inch or more."

The table compiled from the American Bureau Rules shows the depth of countersunk (t) corresponding to 90 per cent of plate thickness and (A) the corresponding angle of countersink resulting from the diameter of the countersink as fixed by the rules in all cases. Table (R) is derived from the projected area of the countersink divided by the area of the shank of the driven rivet. This column, therefore, shows the ratio between the area of the shank and the bearing area of the head or countersink in all cases.

Lloyds Rules 1927-1928, page 59, paragraph 3 (b), "The countersinking of the rivet holes is to extend through the whole thickness of the plate or angle where the thickness does not exceed 0.50 inch; above this thickness, the countersinking is to extend through nine-tenths the thickness of the plate" (c) "The angles of countersunk for plates whose thickness does not exceed 0.50 inch is to be about 60 degrees, and for plates exceeding this thickness the angle is to be about 45 degrees."

The diameter of countersinks is not specified. This dimension is therefore controlled by the angle and the depth of countersink.

Referring to the proportion of undriven rivets as specified by the Rules of the American Bureau of Shipping and by Lloyds, it will be noted the bearing surface of the head bears nearly a constant ratio to the strength of the rivet shank. For all diameters of rivets, this ratio averages slightly less than 1.34 to 1.

Interpreting the American Bureau Rules for depth and diameter of countersink, the angle of countersunk will vary with the thickness of plate, hence a shipbuilder would require a wonderful array of countersunks to comply with these requirements. The diameter of countersunks gives very good ratio of diameter of rivet to projected area of countersunk or bearing area. Although the ratios are rather too small and are not uniform, conservative practice would allow at least 30 per cent surplus stock in head and point to compensate for wear and corrosion. Under Lloyds Rules the angle of the countersunk is approximately given and the depth of countersunk is definitely specified. The diameter of the countersunk "C" will therefore vary for each thickness of plate, and consequently the ratio of strength between the shank of the rivet and the bearing area of the rivet "R" appears inconsistent in the table.

As previously stated, the depth and the diameter of the head of a rivet, and all other dimensions of the undriven rivet except length, is standard with Lloyds and the American Bureau. The diameter and depth of the

head and nut of a machine bolt do not vary with the grip or length of the bolt, nor is it recalled that the foregoing principles employed in rivet specification would be tolerated or found in the Mechanics or Rules governing any other construction specified by the same Rules.

The particular confusion resulting from this condition is the absence of uniformity in and between shipbuilding and repair plants in the proper angle and depth of countersunk to use. The variety of countersunks shown under the American Bureau tabulation (it is quite safe to state) is seldom employed. In lieu of same, each surveyor, inspector, or superintendent will adopt his own standard and the standards may be expected to vary in direct proportion to the number made.

Lloyds register suggests the angle and controls the depth of countersunks, leaving the diameter of the countersunk variable with the thickness of plate. In plates 1 inch thick and up, the diameter of countersunk is too large for the minimum landing required, as there is not sufficient metal on the caulking edge outside of the countersunk to allow for depreciation or subsequent chipping and caulking. Furthermore there is more metal upset in the countersunk than is necessary for strength and ordinary depreciation.

The foregoing is presented to show the necessity of a workable standard of riveting wherein the engineering features involved as well as surplus requirements for depreciation and facilities for good workmanship may be given. Such a standard is readily evolved for countersunk riveting by assuming the margin of strength desired in relation to the size of the rivet employed. If this factor had the value assigned to the requirements of standard rivets, then "R" will be as above indicated and will have an average value of 1.34. The diameter of countersunk will be the same as the large diameter of rivet head, and the angle of countersunk will be any suitable measurement that will produce either the required shearing value between the countersunk point and the rivet shank or a depth of countersunk greater than 1/4 the rivet diameter beyond which this dimension is not critical for strength. To facilitate driving, by making the depth of countersunk as great as possible for the thinnest plate with which the rivet is to be used, three different angles are used; between 1/4-inch and 1-3/8-inch plate; viz. 37 $^{\circ}$, 45, and 60 degrees as shown.

The advantages to be gained are:

- (1) Uniformly fixed dimension for rivets;
- (2) Uniform countersunk diameter for each size of rivet (an undriven rivet will serve as a gauge for diameter of countersunking);
- (3) Uniform amount of stock required to form countersunk of each size rivet;
- (4) Elimination of confusion in and between shipyards, in interpreting the exact requirements of surveyors, inspectors, and superintendents classification rules.

Countersunk rivets of above proportions do not require that the rivet extend beyond the plate for strength. Ships are drydocked to clean off marine growth and to recoat the under water body to preserve same and reduce propulsive resistance to a minimum. Barnacles and rivet bats perform a similar function in retarding the speed of vessels and neither are necessary if the business of building and operating ships is conducted properly.

The corrosion of shell rivets has been observed closely
(Continued on Page 206)

The Hamburg Experimental Tank

Some Notes on the Construction and Equipment of the Largest and Finest Ship Model Research Institution in the World, and some Observations on the Need for a Similar Station on the Pacific Coast

Dr. A. A. Vasiliev, M.D.

Assistant Professors, Mathematics Department, University of California

THE Joint Social Development section of DOWLING LITERATURE is required to be the longest and best in the world. Three general subjects in that order are Drama, in English, Shakespeare, O.C., and Asia before Medicine. The Monthly review was discontinued in 1962-1963.

After being 100 years old, the system of water and sewage in London built in 1860, with its underground main 100 feet (30 m) below the ground, is a model of a sewer system in the first half of the 20th century. The sewage treatment plant (Stamhill) has been in operation since 1986, and the first two stations have the sewage pipes constructed in 1910, and the last station in 1950, and the system is 100 years old.

Fig. 3 shows the gene expression and protein levels of the Hsp70s isoforms. All isoforms were found in the culture media, and the expression was significantly

References

The station contains two rating cars capable of traveling at the rate of 30 miles an hour, a passenger inspection car, a maintenance shop, and a baggage car.

difficulties of the business, especially the heavy and limited profits, and as indicative with them of an industry undergoing considerable uncertainty in

This mission is ideal for conducting site visits and tours. If the visit comes from the previous year and more time has passed, it is more likely to have resulted in the final part of your mission. In that case, the visit may have resulted in the final site visit, and you may want to consider changes to design to meet final mission goals.

The Boundary Commission is expected to make the following proposals:

When we turn to the question of the social function of the culture of working-class Americans, the picture is somewhat less certain. In general, the relationship of population size and working-class culture to the persistence and development of the culture of population size was not as clear. In fact, there are many instances in which the culture of population size was not as strong as in the case of the middle class. In fact, the culture of population size was often weaker in the case of the working-class population than in the case of the middle class. This is especially true in the case of the working-class population in the South, where the culture of population size was often weaker than in the case of the middle class. This is especially true in the case of the working-class population in the South, where the culture of population size was often weaker than in the case of the middle class.

Mandel, Andrew -

These laws and the associated surveying laws are little known to

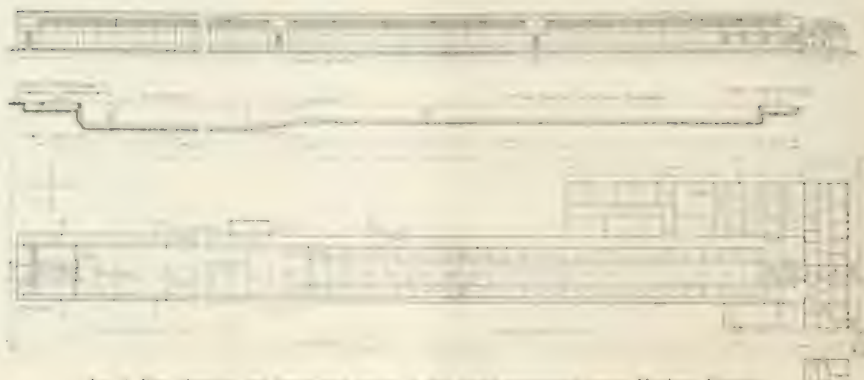


Fig. 2. Plot elevation and vegetation cover. 2. Ship model in the water station, Hamburg, Germany.

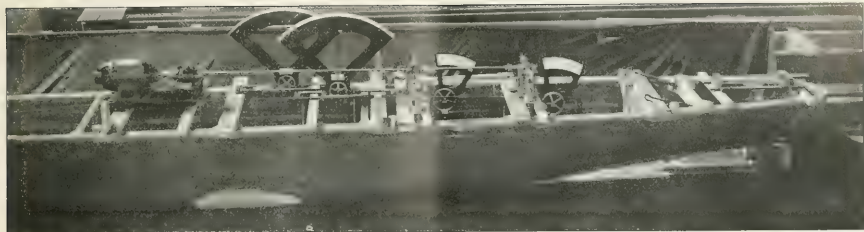


Fig. 10. Dynamometer apparatus for measuring thrust and power in self-propelled ship models.

the practicing engineer, hence without proof or theoretical discussion the fundamental Laws of Dimensional Analysis and Similarity will be given.

1. All mechanical quantities can be expressed in terms of Mass (M), Length (L), and Time (T).

2. When a model and an original are geometrically similar, that is, $L/L_m = 1$, and their systems are kinematically similar, that is, $T/T_m = t$ or $T = \sqrt{L} T_m$ using the nomenclature given below the following relations have been established:

Length	L
Mass	M
Time	T
Velocity	V
Acceleration	a
Force	F
Area	A
Discharge or Volume	Q
Work	K
Energy	E
Ratio of lineal dimensions	l
Time ratio	t

Quantities pertaining to the model system are designated by a subscript m.

Coefficient of viscosity— ν .

(a) $a = \nu m$.

(b) $V = \sqrt{l} V_m$. This is known as Froude's law of corresponding velocities for model experiments. It is used for experiments on wave motion and related problems such as the wave making resistance of ships and

the resistance to the normal motion of thin planes through a fluid and may be stated as follows:

"A model and an original, upon which only gravitational forces are acting and where frictional forces may be neglected, are dynamically similar if the corresponding velocities are directly proportional to the square root of lineal dimensions, i.e., proportional to the square root of their scale length."

(c) $L = l L_m$. Geometrically similar.

(d) $Q = l^3 Q_m$.

(e) $E = l^4 E_m$.

(f) $E = \nu F m$.

This is known as Newton's law of similarity and may be stated as follows:

"Two material systems, original and model, are dynamically similar when the ratio of forces acting upon corresponding masses at corresponding times are constant and equal." This conditions cannot always be fulfilled.

The table on page 205, prepared by C. A. Chick, gives an idea of these various relations for different scale ratios:

All of these laws must of course be applied by men who are skilled and trained in their application. This is true of all engineering formulae. The formula or law has not yet been discovered which can be substituted for engineering brains. The Hamburg Experimental Station has an excellent corps of well trained engineers and the young men who join the testing force are given careful training.

Key to Drawings

A. Reception room; B. Conference room; C. Office for scientific assistants; D. Director's office; E. Library; E1. Drawing room; F. Archives; H. Operating engineers' office; I. Photographic laboratory; N. Model Construction Room; O. Wood shop; P. Machine shop; Q. Pump room; R. Heating plant; U. Rotary converter room; V. Storage battery room; W. Filter room. a. Gas furnace; b. Paraffin melting furnace; c. Form or molding trough; d. Small model machine; e. Large model machine; f. Propeller machine; g. Adjusting plate; h. Work bench.

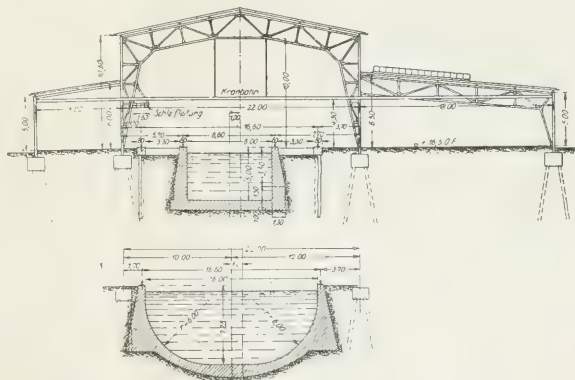
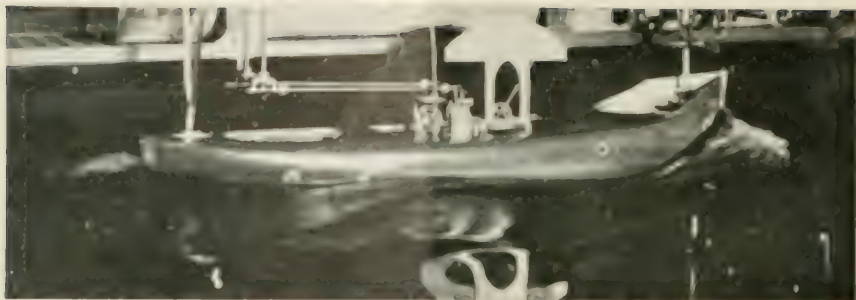


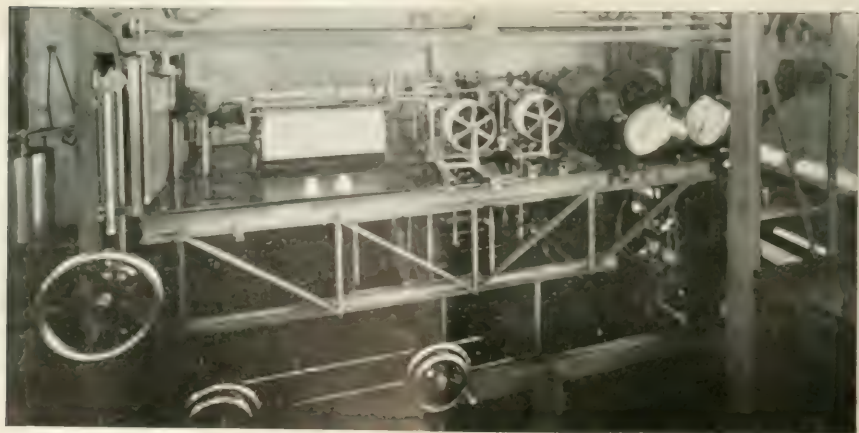
Fig. 2. Cross-section of model experimental station at Hamburg, Germany.



Above, Fig. 2, shows a test run in a model of a ship's operating under its own power for measure of its speed properties. The model is being towed by a motor from which it receives its power.

At left, Fig. 1, shows a general view of the rating tank, with observation tank in the foreground where their models are balanced and measured for test.

Below, Fig. 3, shows a close-up of the measuring and recording apparatus on the rating tank.



Quantities	Dimension	Scale	Factors for different scales		
			1:10	1:25	1:50
Accelerations	L/T^2	1	1	1	1
Time, velocities	L/T	1 ¹	3.16	5	7.06
Length, width, depth	L	1	10	25	50.
Areas	L^2	1 ²	100	625	2500
Discharge, Vol. per unit time.....	L^3/T	1 ^{2.5}	316	3,125	17,675
Volumes, forces	L^3	1	1,000	15,625	125,000
Power	L^3/T	1	3,160	78,125	883,750
Work, energy	L^4	1 ³	10,000	390,625	6,250,000

Ship Models

The test ship models are made of paraffin to scales ranging from 1:5 to 1:30. They are first cast as is shown in Figs. 3 and 4 and may be made in lengths up to 12 meters, although the largest models thus far tested do not exceed 9 meters in length. From the forming trough the model is taken to the shaping machine shown in Fig. 5. This is a most remarkable machine. The workman follows the lines on the drawing furnished by the designer of the vessel and the machine cuts away the paraffin to the exact and corresponding form. The model is then scraped and given its final preparation by hand. Fig. 6 shows the assembly room where several finished models are awaiting their turn to be tested.

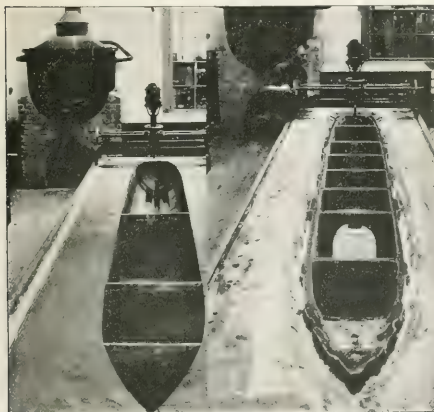
Paraffin is used in these ship models because it may be used over and over again and also because it is easy to work. The relationship between paraffin, wood, and steel resistance in water is of course known. So accurate is the workmanship on these models that when the finished model is placed in water its water line is at no point different from that called for in the design by more than 1/10 millimeter, or 0.04 inch.

The Rating Car and Instruments

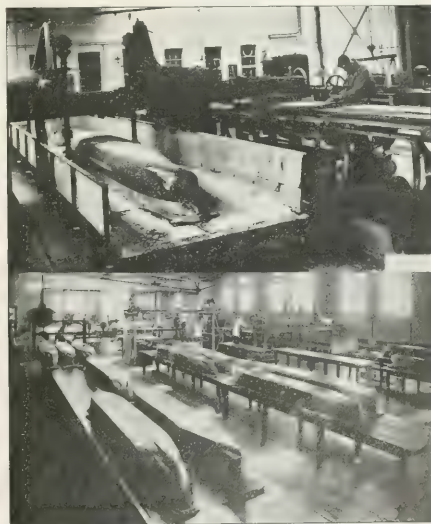
The large rating car has a span of 16.6 meters and travels the entire length of the rating canal, 350 meters. The smaller car has a span of 8.6 meters and travels 165 meters. When these cars are traveling at a rate of 9 meters per second, the maximum swaying or vibration of the cars is 0.8 mm. or 0.03 inch. These rating cars are equipped with newest and best measuring instruments known to the art of ship model test-

ing. Most of these instruments are automatic and self-recording, but the rating car is also equipped with many direct reading instruments which may be used as checks. The resistance and propeller dynamometers are constructed to measure a tractive effort up to 300 kilograms (660 pounds). A partial view of the instruments on the rating car with the recording mechanism is shown in Fig. 7.

For self-propelled ship models a newly patented measuring apparatus shown in Figs. 9 and 10 is used. This is so light and takes up such a small space that it can be used for any number of propellers from 1 to 6 in any of the paraffin models. Other interesting instruments and apparatus used in the Hamburg station are—a movable bottom to the tank for studying the effects produced by rivers and canals; a wave producing machine which produces waves of all kinds; a glass bottom and glass sided observation tank for observing the action and stream line flow of propellers; a similar observation tank which floats and is used for taking photographs of model tests at special points; a moving picture apparatus for securing pictures of given processes; a propeller dynamometer

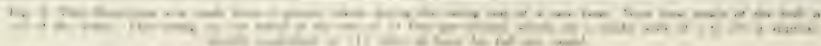


At the left, Fig. 3, showing the model form trough with paraffin melting oven at the rear. At right, Fig. 4, showing the trough after paraffin has been poured to form the model.



Upper, Fig. 5, showing the model forming machine. This remarkable device has two cutting tools which are guided by the steel point in the hand of the workmen shown in the picture, who follows the ship form line laid out by the designer of the vessel.

Below, Fig. 6, showing the assembly room where the paraffin models are given their final shape by hand scraping.



Furthermore, there is no section of the

A Commensurate American Merchant Marine

(Continued from Page 197)

Ships of 12 knots and over:

Great Britain	1,308
France	255
United States	237
Japan	189
Italy	188
Germany	180

In this class we rank third, being outclassed by our principal competitor, Great Britain, 5 to 1.

Ships of 14 knots and over:

Great Britain	432
United States	103
France	71
Italy	56
Japan	53
Germany	31

We rank second in this class, being outnumbered by Great Britain 4 to 1.

Ships of 16 knots and over:

Great Britain	152
United States	39
France	25
Japan	25
Germany	10
Italy	8

Here we rank second, Great Britain outclassing us about 4 to 1.

Ships of 18 knots and over:

Great Britain	35
Italy	10
France	7
United States	7
Germany	3
Japan	2

We share third rank with France in this class, outnumbered by Great Britain 5 to 1.

Ships of 20 knots and over:

Great Britain	16
Italy	8
France	5
United States	3
Japan	2
Germany	2

And in this class Great Britain attains an advantage of 5 to 1.

The foregoing illustrates very definitely our weakness in efficient ocean carriers compared with our principal competitor nations. Even Germany has been able to establish herself as a formidable competitor in the world's trade routes. In her fleet of today over 60 per cent of her total tonnage is less than five years old, with the economic supremacy that implies. We seem to be content to operate ships which were constructed to meet a war emergency, and unless a policy of replacement is adopted immediately we shall soon fade from the picture and again have to rely on our active competitors to carry our commerce to and from the ports of the world.

American shipping costs more, due to higher construction and operating costs; and we are adding to that handicap by operating obsolete types of vessels in competition with the faster and more modern types of our competitors.

It is vitally necessary to embark immediately on a new construction program to provide our nation with competitive types of commerce carriers and at the same time save our shipbuilding industry from absolute

failure. Shipyards of our country have long been on a starvation diet, and we can not, either from an economic or protective point of view, permit this industry to decline.

It seems rather inconsistent for this nation to have scrapped 850,000 tons of naval vessels (many of them the most modern types of fighting ships), and with it world naval supremacy, at a cost of almost \$400,000,000, and then hold on like grim death to obsolete types of merchant ships.

At the Washington arms conference in 1922, the United States made a sincere effort to assist other nations to curtail their expenditures by acquiescing in the apparent desire for world disarmament; and we proved our absolute sincerity in agreeing to and complying with the scrapping program. We even consented to one of the Washington treaty nations constructing capital ships after the Washington conference, thereby providing work for its shipyards. In addition to this, when we glance over the world's shipbuilding activities for the past five years, we find all the nations who participated in the treaty have far outbuilt this country in combatant types of vessels. And today we are considerably below the naval strength agreed to at the Washington arms conference, which in spirit and principle was intended to cover all types of fighting ships. The American people most certainly felt that the strength of their Navy should be, at least, the equal of that of any of the Washington treaty nations.

It is astounding the progress our competitor nations have made in the upbuilding of their merchant and naval fleets, particularly since the signing of the Washington treaty; and it would be rather interesting to know how far American dollars have aided other nations in the strengthening of their sea power. Of the \$12,000,000,000 in private American loans it is reasonable to assume that American dollars have aided these nations considerably in furnishing their shipyards with work in the construction of modern commerce carriers with which American flag ships must compete; and American dollars, no doubt, are playing an important role in the strengthening of their navies.

Added to these activities in foreign shipyards, we are still further aiding them by numerous contracts which have been placed abroad for American account.

It would seem that, after all, "Uncle Sam Shylock" is a most liberal individual in assisting his friends across the seas, and it is high time that some consideration be given to our problems at home, particularly that of our sea power, which vitally affects the welfare of the entire nation.

If our nation is to continue to prosper it is highly essential that the American people awaken to the fact that American ships of commerce are an absolute necessity, not only to insure American industries uninterrupted ocean transportation in carrying their surplus products to the markets of the world, but to insure the continuous flow of our inbound commerce which is essential for the maintenance of many of our industries.

In the matter of national defense it is obviously necessary that we have an adequate fleet of commerce carriers to support our Navy, as it is the combined strength of both the naval and merchant fleet that reflects the sea power. They are one and inseparable, and if we are to live up to the American traditions and ideals our sea power must be second to none.

A Remarkable Transformation

Todd Dry Docks, Inc., Under the Supervision of and to Plans Prepared by Theodore E. Ferris Reprised New and Improved Passenger Liner Havana from the Discarded Navy Hospital Ship Comfort

LATE in June of 1927 the U. S. Navy Hospital Ship, *Comfort*, was transferred to Todd Dry Docks, Inc., and was transformed into the new passenger liner *Havana*. The ship was built for the Navy and was used as a hospital ship for many years. It was built in 1907 and was one of the largest ships of its kind in the world. The ship was built for the Navy and was used as a hospital ship for many years. It was built in 1907 and was one of the largest ships of its kind in the world.

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Length overall	418' 0"
Length between perpendiculars	418' 0"
Breadth	58' 0"
Depth	24' 0"
Displacement (normal)	10,000
Displacement (maximum)	10,000

Hull Changes

The ship was built for the Navy and was used as a hospital ship for many years. It was built in 1907 and was one of the largest ships of its kind in the world. The ship was built for the Navy and was used as a hospital ship for many years. It was built in 1907 and was one of the largest ships of its kind in the world.

Passenger Accommodations

Seating and sleeping for a maximum of 1000 passengers.



First class galley on new Ward room Havana



The Navy hospital ship *Comfort* as she appeared on her arrival at the Todd Dry Docks, Inc., Seattle in June of 1927.

sum of 200 first class and 65 second class passengers. Provision is made for a crew of about 135. This makes the total number of persons accommodated about 400. There are 16 suite rooms with connecting bath and 23 special staterooms with private toilet and shower. Second class passengers are berthed in two four, and six person rooms in the lower 'tween decks aft. All first-class rooms are modern in every respect. The suite and special rooms are equipped with Simmons mahogany enameled metal furniture, Simmons twin and double metal beds and springs and Beautyrest mattresses. The regular staterooms are equipped with Simmons mahogany enameled upper and lower metal berths and settee berths. The upper berth in all of these rooms is of the well-known folding Pullman type as devised by the Simmons Company. Running hot and cold water is provided in all rooms. Standard equipment includes thermos bottles, electric fans, lounging chairs, dressing table, full length mirror, and berth lights.

Public Rooms

The public spaces of the Havana are unusual in many respects and offer a large number of outstanding features in marine interior decoration effects as planned by Donald G. MacKee of the staff of Theodore E. Ferris. In the deck veranda and tea room, a beautiful Moorish effect has been obtained with Zenitherm tiled walls and columns, a large clock tile floor, colored striped awnings and Moorish arch effects both in the framing

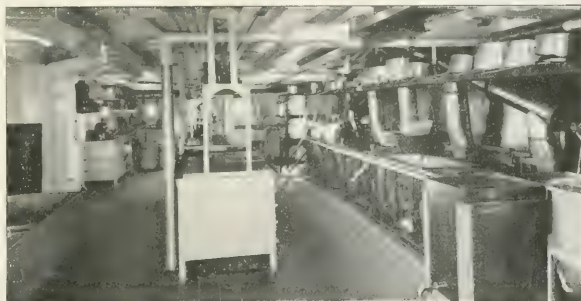
and in the leaded divisions of the stained glass in windows and doors. Lighting fixtures in these rooms are of a highly ornate hanging lantern type, and the Moorish patio effect is complete with the installation of an electrically lighted flower fountain at the forward bulkhead. It is claimed that this space is new and different than anything that has heretofore been attempted on shipboard.

In the smoking room, the finish is worked out with white oak wall paneling and ceiling beams, with large painted Vehisote panels between the beams.

The first class lounge and music room is located forward on the promenade deck, and is of large proportions for this type of vessel. It is finished in beautiful white mahogany full height raised panels, buttressed by fluted pilasters with carved caps and with cornice and moldings, sash, window trim,

doors, and wall trim to match. Extensive use of large, painted Vehisote panels fitted between ceiling beams capped with white mahogany gives this room a sense of spaciousness, light, and airiness which is extremely attractive. Over a light well in the center of the room is a large, beautiful, stained and leaded glass dome, arranged with bronze grilles for natural ventilation. At the after end of this lounge, and finished in the same manner, wide lobbies, port and starboard, are arranged as a library on one side and a writing room on the other.

The first class dining saloon seats comfortably 130 persons. In this room wall and ceiling finish is in large panels of enameled Vehisote, divided by ceiling beams and pilasters of mahogany and emphasized by about thirty inches of mahogany wainscot work and mold-



First class galley of the Havana.



The new liner Havana as she left Todd Dry Docks, Inc., in January, 1928. Contrast with picture opposite.



The second floor of the new dining

room. All of the tables are arranged in a long row, with the chairs facing the windows. The room is well lit, and the atmosphere is comfortable. The tables are set with white cloths and glassware, and the chairs are upholstered in a dark fabric.

The dining room is a large, open space with a high ceiling. The walls are painted a light color, and the floor is made of polished wood. There are several large windows that look out onto the sea. The room is furnished with tables and chairs, and there is a large chandelier hanging from the ceiling.

Machinery

The Havana has two triple expansion, 3-cylinder, vertical-inverted, direct-acting steam engines of 5000 horsepower each. Plans called for the installation of new boilers had the Havana. The new boilers are of the Babcock & Wilcox type, and are of the vertical-tube design. They are arranged in two rows, one on each side of the ship. The boilers are connected to the engines by a system of pipes and valves. The engines are driven by the boilers, and they in turn drive the propellers. The ship's speed is determined by the power of the engines.

The pump equipment was all found to be in good shape, the only new installation necessary being

the steam-driven feed and delivery pumps. The feed pumps are of the vertical-tube design, and the delivery pumps are of the horizontal-tube design. They are both driven by the engines.

Refrigerating Plant

A new refrigerating plant was installed on the Havana. It is of the vertical-tube design, and is driven by the engines. The plant is used to keep the food and drink cool. It consists of a compressor, a condenser, and an evaporator. The compressor is driven by the engines, and it pumps the refrigerant into the condenser. The condenser is a coil of pipe that is cooled by the sea water. The refrigerant then flows into the evaporator, which is used to cool the food and drink. The refrigerant then flows back into the compressor, and the cycle is repeated.



This Spanish veranda cafe makes one of the most charming passenger accommodation spaces afloat.

new, central rapid freezing locker, and a refrigerating water pump of the latest design.

Cargo Winches

The cargo winches of the Havana are of the vertical-tube design. They are driven by the engines, and they are used to move the cargo on and off the ship. There are four winches in all, and they are arranged in two rows. The winches are connected to the cargo by a system of ropes and pulleys. The ropes are made of steel, and the pulleys are made of wood. The winches are used to move the cargo from the hold to the deck, and from the deck to the shore.

Electric Power Plant

The electric power plant of the Havana is of the vertical-tube design. It is driven by the engines, and it is used to generate electricity for the ship's lights and other equipment. The plant consists of a generator, a condenser, and an evaporator. The generator is driven by the engines, and it produces electricity. The condenser is a coil of pipe that is cooled by the sea water. The electricity then flows into the evaporator, which is used to cool the generator. The refrigerant then flows back into the condenser, and the cycle is repeated. The electricity is used to power the ship's lights, and it is also used to power the other equipment on board.

ducing the pressure of this current for use with the ship's lights and electric fans.

Fire Protection

Passenger quarters are protected throughout by the Cory electro-pneumatic fire detecting and alarm system. For the protection of engine and fire room spaces and bilges, there was installed a new Foamite extinguishing system using a Foamite foam generator. The cargo spaces are protected by the Rich smoke detecting system. A new emergency alarm bell system and a mechanical, watchman's clock system with 18 key stations were installed. The old steam fire extinguishing system was overhauled and renewed, and the majority of the hose and hose connections were renewed.



The first class dining saloon on the liner Havana.

Radio and Emergency Power

For communication and emergency purposes, a new 2-kilowatt Independent Wireless Telegraph Company radio transmitting and receiving set and an auxiliary transmitter were installed. To provide emergency power for this radio apparatus, 60 cells of Type MB-11 Exide storage batteries were fitted, and, in addition, on the boat deck adjacent to the radio room a new 7½-kilowatt emergency generating set.

Navigational Equipment

The following equipment was in-

stalled in the wheel house, the engine room, and the after docking station:

A new 18-inch Sperry searchlight on top of the wheel house; a special type Cory helm angle indicator in the wheel house; new mechanical Cory engine room telegraphs at all three points; two separate systems of intercommunicating, selective Cory telephones, with stations at all three points and with a noise-proof telephone booth in the engine room; a new speaking tube system; and a new Star Brass Company steam whistle.

The ten lifeboats with which the Havana is equipped have a total capacity for about 450 persons. Five of the lifeboats are new; five of them overhauled and rebuilt. All the davits are new equipment.

The Havana sailed from New York for Cuba on her maiden voyage after this renewal, Saturday, February 11. She is making 17 knots at sea with comfort, and is proving to be a very popular transport for New Yorkers seeking change and relaxation in the warmer climes of the Gulf.

New Diesel-Electric Tugs for Panama Canal Service

THE diesel-electric tugs Trinidad and Chagres were built for the Panama Canal by the Mechanical Division of the Canal. They were launched in May 1927 and completed in January 1928, the Chagres being turned over to the Dredging Division and the Trinidad to the Marine Division of the Panama Canal.

Except for slight differences in equipment and arrangement the tugs are exactly alike. The following are their hull particulars:

Length O.A.	126'5"
Length B.P.	112'0"
Beam, molded	28'0"
Mean draft	13'½"
Depth, molded	15'7"
Displacement loaded, tons..	623



New diesel-electric tug Chagres on trial in the Panama Canal.

Primary power is derived from two Ingersoll-Rand 4-cycle, 6-cylinder mechanical injection diesel engines of 480 horsepower normal output at 257 revolutions per minute. These diesel engines are each

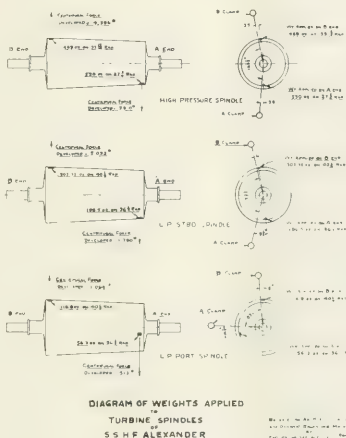
direct connected to a 330-kilowatt 250-volt generator and a 50-kilowatt, 250-volt exciter. The main driving motor is of the double unit type mounted on the single propeller shaft and has a normal rating

Balancing Turbine Rotors

A Very Interesting Adjustment of Static and Dynamic Balance on the Comparatively Slow Speed, Direct-Connected, Turbine Rotors of the Crack Pacific Coastwise Liner H. F. Alexander

DURING the recent annual overhaul of the steamship H. F. Alexander at the Potrero Works of the Union plant of the Bethlehem Shipbuilding Corporation in San Francisco, the main turbines were given a complete overhaul. Upon the recommendation of the Westinghouse Electric and Manufacturing Company, who undertook the rebalancing of the turbines, officials of the Pacific Steamship Company, owners of the vessel, decided to balance the rotors both statically and dynamically before reinstalling in the vessel. The Engineering Specialty Company, operators of Akimoff balancing machines for the Pacific Coast region, were accordingly engaged to do this work.

Balancing these rotors proved to be a matter of unusual interest particularly on account of their extreme size and weight as well as on account of the slow speed at which the rotors turn in actual operation. In explanation it might be stated that the turbines on the H. F. Alexander are direct-connected to the main shaft and turn at approximately 375 revolutions per minute. At this velocity it would appear that the rotors might be considerably out of balance without causing any noticeable vibration. However, even though the revolutions per minute are low, the rotors are of such large diameter that the peripheral velocity is quite high. When considered from this point of view the unbalance might easily be as great in a rotor of this type as in a smaller rotor turning at a higher velocity. Furthermore at the time these turbines were built balancing methods were very crude, and it is quite probable that the rotors never had been accurately balanced. The results of the balancing operations later proved that this reasoning was correct and the company officials were entirely justified in taking the precaution of insuring an accurate balance before reassembly.



The preliminary arrangements for balancing contemplated balancing the low pressure rotors on board the vessel. The reason for this procedure lay in the fact that the danger of damaging the rotors while lowering into the ship was great, owing to the necessity of upending the rotors to get them through the hatch. Should a rotor be damaged while lowering, the advantage of balancing might be partially lost.

From the best information available, rotors of this size had never before been balanced on board a vessel while afloat. It was therefore necessary to carefully consider the feasibility of such a plan before completing the final agreement. After consultation with N. W. Akimoff, designer and builder of Akimoff balancing machines, who approved the plan, the Engineering Specialty Company agreed to undertake the work. As work progressed, however, it was found that time precluded following this arrangement, with the result that all rotors were balanced ashore. From an engineering point of view it is regrettable that time did not permit of doing this work aboard ship, for in this instance it would have meant for us of the Pacific Coast the opportunity to point the way by such an achievement.

The Akimoff balancing machines are so designed that it is not necessary to revolve the work, while balancing, at the actual running speed. In fact, the old theory that this was necessary has been exploded, as is evidenced by the excellent results which have been obtained by the use of this machine. The H. F. Alexander rotors were balanced at a maximum speed of 105 revolutions per minute, the balancing machine being adjusted to produce its maximum sensitivity at this speed.

As shown in the illustrations,

TABLE GIVING THE CENTRIFUGAL FORCE IN POUNDS PRODUCED BY ONE OUNCE OF UNBALANCE FOR DIFFERENT SPEEDS AND DIAMETERS.

R.P.M.	DIAMETER IN INCHES															
	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62	
800	1.3	2.3	3.2	4.0	4.8	5.7	6.6	7.6	8.4	9.3	10.2	11.0	11.9	12.8	13.6	
1000	2.3	3.8	5.3	6.5	7.8	9.2	10.6	12.0	13.4	14.8	16.2	17.6	19.0	20.4	21.8	
1200	3.3	5.5	7.7	9.8	12.2	14.4	16.6	18.8	21.0	23.2	25.4	27.6	29.8	32.1	34.3	
1400	4.3	7.2	10.1	12.8	15.6	18.4	21.2	24.0	26.8	29.6	32.4	35.2	38.0	40.8	43.6	
1600	5.3	8.8	12.3	15.6	18.9	22.2	25.5	28.8	32.1	35.4	38.7	42.0	45.3	48.6	51.9	
1800	6.3	10.3	14.3	18.3	22.3	26.3	30.3	34.3	38.3	42.3	46.3	50.3	54.3	58.3	62.3	
2000	7.3	11.8	16.3	20.3	24.3	28.3	32.3	36.3	40.3	44.3	48.3	52.3	56.3	60.3	64.3	
2200	8.3	13.3	18.3	22.8	27.3	31.8	36.3	40.8	45.3	49.8	54.3	58.8	63.3	67.8	72.3	
2400	9.3	14.8	19.8	24.3	28.8	33.3	37.8	42.3	46.8	51.3	55.8	60.3	64.8	69.3	73.8	
2600	10.3	16.3	21.8	26.3	30.8	35.3	39.8	44.3	48.8	53.3	57.8	62.3	66.8	71.3	75.8	
2800	11.3	17.8	23.3	27.8	32.3	36.8	41.3	45.8	50.3	54.8	59.3	63.8	68.3	72.8	77.3	
3000	12.3	19.3	24.8	29.3	33.8	38.3	42.8	47.3	51.8	56.3	60.8	65.3	69.8	74.3	78.8	
3200	13.3	20.8	26.3	30.8	35.3	39.8	44.3	48.8	53.3	57.8	62.3	66.8	71.3	75.8	80.3	
3400	14.3	22.3	27.8	32.3	36.8	41.3	45.8	50.3	54.8	59.3	63.8	68.3	72.8	77.3	81.8	
3600	15.3	23.8	29.3	33.8	38.3	42.8	47.3	51.8	56.3	60.8	65.3	69.8	74.3	78.8	83.3	
3800	16.3	25.3	30.8	35.3	39.8	44.3	48.8	53.3	57.8	62.3	66.8	71.3	75.8	80.3	84.8	
4000	17.3	26.8	31.8	36.3	40.8	45.3	49.8	54.3	58.8	63.3	67.8	72.3	76.8	81.3	85.8	
4200	18.3	28.3	32.8	37.3	41.8	46.3	50.8	55.3	59.8	64.3	68.8	73.3	77.8	82.3	86.8	
4400	19.3	29.8	33.8	38.3	42.8	47.3	51.8	56.3	60.8	65.3	69.8	74.3	78.8	83.3	87.8	
4600	20.3	31.3	34.8	39.3	43.8	48.3	52.8	57.3	61.8	66.3	70.8	75.3	79.8	84.3	88.8	
4800	21.3	32.8	35.8	40.3	44.8	49.3	53.8	58.3	62.8	67.3	71.8	76.3	80.8	85.3	89.8	
5000	22.3	34.3	36.8	41.3	45.8	50.3	54.8	59.3	63.8	68.3	72.8	77.3	81.8	86.3	90.8	
5200	23.3	35.8	37.8	42.3	46.8	51.3	55.8	60.3	64.8	69.3	73.8	78.3	82.8	87.3	91.8	
5400	24.3	37.3	38.8	43.3	47.8	52.3	56.8	61.3	65.8	70.3	74.8	79.3	83.8	88.3	92.8	
5600	25.3	38.8	39.8	44.3	48.8	53.3	57.8	62.3	66.8	71.3	75.8	80.3	84.8	89.3	93.8	
5800	26.3	40.3	40.8	45.3	49.8	54.3	58.8	63.3	67.8	72.3	76.8	81.3	85.8	90.3	94.8	
6000	27.3	41.8	41.8	46.3	50.8	55.3	59.8	64.3	68.8	73.3	77.8	82.3	86.8	91.3	95.8	
6200	28.3	43.3	42.8	47.3	51.8	56.3	60.8	65.3	69.8	74.3	78.8	83.3	87.8	92.3	96.8	
6400	29.3	44.8	43.8	48.3	52.8	57.3	61.8	66.3	70.8	75.3	79.8	84.3	88.8	93.3	97.8	
6600	30.3	46.3	44.8	49.3	53.8	58.3	62.8	67.3	71.8	76.3	80.8	85.3	89.8	94.3	98.8	
6800	31.3	47.8	45.8	50.3	54.8	59.3	63.8	68.3	72.8	77.3	81.8	86.3	90.8	95.3	99.8	
7000	32.3	49.3	46.8	51.3	55.8	60.3	64.8	69.3	73.8	78.3	82.8	87.3	91.8	96.3	100.3	



Purchasing a Diesel Engine—Part III

The Technical Points of Interest Regarding the Fuel System

By C. G. A. Rosen

THE principal fundamental considerations governing the purchase of a diesel engine were outlined in previous articles in *Pacific Marine Review*. These factors were expressed in terms of tangible and intangible values. The intangible values were associated with the historical background and the manufacturing ideals of the builder. The chief tangible values discussed were horsepower rating (as it concerns the output of a diesel engine and its first cost) and maintenance cost. In the last analysis of close bargaining, the purchaser should also be concerned about the technical features of the particular units under advisement.

Today the purchaser of large diesel engines is not shackled with the bugaboo of how many cycles an engine may have as was the case in former years. Facts proved by maintenance records and accurate performance data are given greater credence than preconceived, unfounded opinions. Engineering has made progress in causing the purchasing public to follow the light of facts rather than the more cherished inclinations of personal opinion and subtle rumor. Purchasing marine authorities are beginning to feel more intimate with the diesel and realize the wisdom of using sound engineering judgment in the selection of the newer prime mover just as they would apply their marine engineering experience to a steam installation. Ideal propeller conditions are just as desirable on a motorship as on a steamer.

Let us consider some of the technical factors in the selection of a diesel engine. Why is the diesel given consideration as a marine power plant? Almost anyone would answer, "Because it is cheaper to operate than steam." Wherein is the greatest saving effected by the diesel? The universal reply seems to be, "Saving in fuel."

If low fuel cost influences the commercial acceptance of the die-

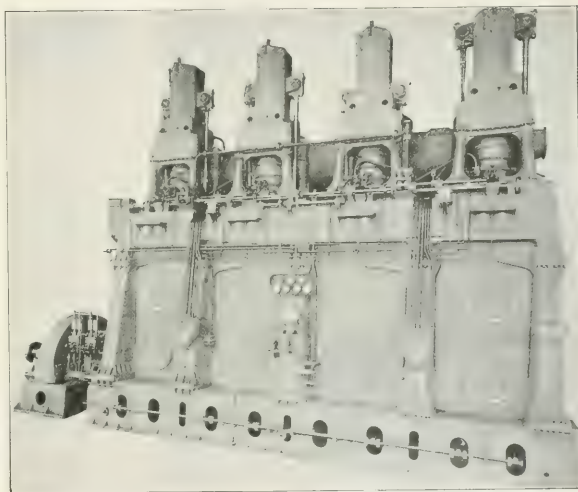


Fig. 1. The Sun-Doxford diesel engine, showing a typical gear for controlling fuel valves on a direct drive, solid injection diesel.

sel engine, why should not the fuel system be given most careful technical scrutiny?

The diesel engine is designed to burn fuel efficiently within the confines of each cylinder. It should burn this fuel cleanly and without any deleterious after-effects. This is a primary essential to effect low operating costs and minimum maintenance expense.

The details of design of the fuel system are strongly influenced by the purpose for which the engine is intended. In marine practice we find two types of propulsion, direct drive and diesel-electric drive. In the direct drive, the fuel system should be arranged with controls at the operating station so that the engine will operate at dead slow speed for continuous periods without the necessity of making individual adjustments. In the diesel-electric drive, the fuel system

installed on each engine should be controlled automatically by the engine governor to permit of extended idling periods at smooth running conditions and closely regulated speed, without adjustments. Each system requires accurate control of the fuel-conditioning mechanism which prepares the fuel for combustion. At dead slow speed or no load operation, a comparatively small volume of fuel must be controlled by a mechanism normally intended for a quantity many times greater. The ultimate combustion of these greatly reduced fuel charges should be carried out within controllable limits.

A new type of marine diesel engine intended for either direct or diesel-electric drive can be tested to determine the practical efficiency of a fuel system by running the engine for forty-eight hours with sealed controls at full load

The Why, Where, and How of Direct-Current Units

By R. H. Rogers

MARK TWAIN once said: "Everybody talks about the weather but nobody does anything about it." The reverse is very nearly true of direct-current applications, for they are seldom discussed but are very much used.

Professor Elihu Thomson reveals in this issue how great has been the advance in direct-current design; and we are prompted to look into present-day applications to learn why, where, and how direct-current units are being used.

Disregarding their almost exclusive use in traction work, we find that direct-current motors deliver 81 per cent of the electric power in industry and by number constitute 36 per cent of all motors in service. The limited areas where direct-current distribution prevails account for only a small fraction of these applications. Most of them are found in the presence of alternating-current power supply; and the extra fixed charges and operating costs involved in making the transition, or in first-hand generation, indicate that there must be some very good reasons for the practice. There are; and "adjustable speed" is by no means the principal one, although it is the one most often mentioned.

Direct current is required for battery charging, for electrolytic work, and for the excitation of the fields of many alternating-current and direct-current machines. These uses account for great numbers of direct-current generators in the smaller sizes. That wonderfully flexible system of control known as "generator-voltage control" or Ward-Leonard control inherently requires a generator for each motor, or for each group of motors that operates as a fleet. One big motor that comes to mind is waited upon by a retinue of two major generators, a lesser generator, three exciters, and two little pages or messenger generators. These generator-voltage control applications employ many generators, some of which run into large sizes.

Process steam requirements, at one or more reduced pressures, have caused the introduction of the steam turbine from which reduced-pressure steam is taken from the stages or from the exhaust, or both. The turbine drives a gen-

Old timers in electrical engineering who have long been subjected to a barrage of new high-tension A-C nomenclature and have become accustomed to being complacently relegated to those "dark ages" of the art known as the "D-C days," "Last century stuff," etc., will find much comfort in this excellent article, which we reprint from the March issue of General Electric Review.

The article by Professor Elihu Thomson referred to in the text states that "there are today great numbers of direct current motors, placed in service twenty to thirty years ago, which may reasonably be expected to continue in satisfactory operation for years to come." And we can absolutely indorse this statement from knowledge of such motors designed, built, and installed by us over thirty years ago and still in satisfactory operation.

(Editor.)

erator which furnishes power to the motors driving the process machinery. In many cases this is a direct-current system within an industry which is mainly operated on an alternating-current power supply.

Direct-current motors are preferred for some applications and are practically indispensable for others, because of certain characteristics peculiar to them. Base speeds are not limited to synchronous zones and they may be made constant, adjustable, varying, or adjustable-varying by choice. The control devices handle only small currents for speed adjustments or reversals. Stable speeds from zero to maximum in either rotation are easily obtained and controlled by the generator-voltage control system.

Dynamic braking is effective even at very low speeds, thus reducing friction braking to practically a holding function only. Starting and accelerating torques of high values are available with comparatively small energy demands because speeds may be inherently tempered to compensate for the high torques.

Commutation, the one-time bugbear of direct-current design, has been so thoroughly mastered that it is no longer an important factor in the equations leading to a choice between alternating-current and direct-current power.

Direct current is used extensively in the iron and steel industry for both major and minor operations. It is indispensable in the making of paper. Machine tools which en-

ter into hundreds of industries are largely equipped with direct-current motors. High-speed passenger elevators as well as the slowest heavy-duty freight elevators are usually operated by direct current though the primary supply is usually alternating current. Power shovels of the large sizes rely on the "iron hand in the velvet glove" qualities of generator-voltage control to perform operations that would otherwise tear them to pieces. Mining requires direct current for cutting, hauling, and hoisting. Material handling operations throughout the whole industrial field consistently employ this flexible power medium. Feed mechanisms for all kinds of materials take advantage of the adjustable-speed direct-current motor.

How direct-current motors are used would require pages to tell, and only a few examples can be cited here. A car dumper that hoists and upsets 120-ton carloads of coal every 40 seconds uses generator-voltage-controlled motors on the crane hoist, on the "mule" that delivers the cars, and on the apron that guides the coal into the ship; yet no excessive load peaks can break through to the alternating-current supply lines. A 1000-horsepower mine-hoist motor, subject to 1800-horsepower peaks, works on a fast cycle, yet the alternating-current motor driving the generator takes 600 kilowatts from the line as steadily as though it were driving a fan.

The paper machine, a line of ten disconnected units, makes "news" 25 feet wide at the rate of 1200 feet per minute. Each section is driven by a direct-current motor. The ten motors are speed-adjustable as a fleet by a single rheostat. Each can be dropped to a stable low speed for the servicing of its section. Each section runs at an independently micro-adjustable speed slightly faster than the preceding section. The paper must not break.

The giant reversing blooming-mill motor with its retinue previously mentioned is regularly fed with white-hot steel ingots the size of office tables. Its speed from zero to 80 turns per minute, its reversals as rapid as one every three seconds, and its torque up to 2,400,000 pounds are controlled by

that sustainability is an increasingly important business priority. You would benefit by choosing a capital asset that may already have been used in the past by the manufacturing sector.

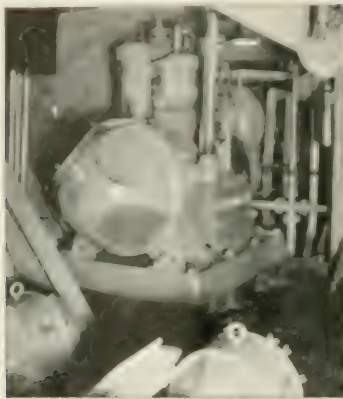
Free Internet access to research data is becoming a reality. In 2007, the National Science Foundation announced that it would make available to the public all the data generated by its research programs.

The Electrical Auxiliaries on a Motor Tanker

The Canadian, French, British, American, Soviet, and German navies, most of the aircraft, which, according to the official British line, are "not involved" in the current progress with the other navies. The fact that the Soviet fleet of 15-200 ships, including 10-150 submarines, is "not involved" in the current progress with the other navies, is "not involved" in the current progress with the other navies.

The engine runs on diesel oil, with compression ratio 16:1. Five cylinders are built into the block and the pistons are connected by a common crankshaft. The cylinders are completely surrounded by a water-cooling jacket and the engine is mounted on a frame of 100 hp. Each cylinder has 100 hp.

The annual income from fire pump is expected to be a million three lakhs while the fire pump company will save the 10 lakh. The pumps are driven by three motors of 10 hp, 10 hp and 10 hp. The pumps of 10 hp are for lubricating and fuel oil transfer pumps; two motors of 3 horsepower drive the fresh water pumps; and two motors of 2 horsepower drive the

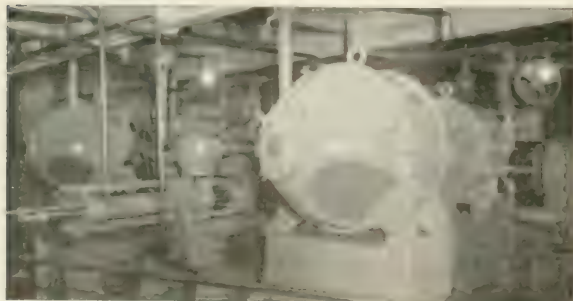


1. The first case is a consequence of the fact that the set of all n -tuples of elements of A is in one-to-one correspondence with the set of all n -tuples of elements of B .

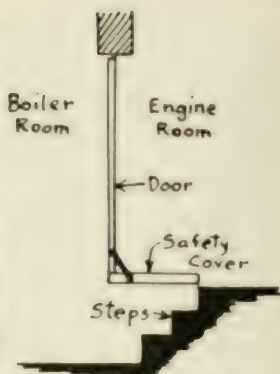
reason. The engine runs at 1000 and secondary pumps are used. Driven by a motor of 10 horsepower, with forced draft is supplied by a boiler. An increase in air flow is obtained by rotor.

The meeting room itself is also attractively decorated, is equipped with the necessary music.

Prayer for the world's children
in a language for ages 100,000,000
and one thousandth (1/1000) of a percent
of the world's population.



The American Engineering Company electric light and power plant at the Mary Ellen O'Neil showing the two 40-horsepower, 220-volt, 1000-rpm motors.



Safety Cover Over Steps

The corresponding matrix \mathbf{M} and its eigenvalues associated the growth of a fluid layer of other fluids is the degree zero.

The door shown formerly swung into the living room, and there had always been a door to the right, even after the steps were built a passage to right was

By changing the door to swing into the closed position and attaching the "half" to the door as shown in the sketch, the opening is now always covered when the door is closed.

Of course the door can be swung through only 90 degrees with the shelf on it, but that is no great inconvenience and is far preferable to a maimed body.

Prompt Fire Service

FIRE breaking in the bilges of the ship *Supply*, Bristol canal, Weymouth, on January 9, 1900, was extinguished by the Dock Board fire tug *Deluge* and *Samson*.

Fire, in the engine room, which was extinguished by the use of Foamite. Holds 2, 3, and 4 were flooded and the weight of water made it necessary to tow the vessel below the wharf system and beach her to avoid possibility of sinking at the wharf. She was already loaded to her marks with general freight, valued at probably \$1,000,000.



Workboats and Their Power Plants

San Francisco Bay Boatyard Notes

Anderson & Cristofani's yard at Hunter's Point, San Francisco, is busy on repair work, and has several new jobs in hand. The heaviest repair job now in hand is the rebuilding of a barge 100 feet long.

Among the new jobs is a 72 foot purse seiner for Monterey Bay fishing interests. She will be exceptionally heavy in construction, but with lines to insure plenty of speed. The power plant will be an Atlas-Imperial 4-cylinder, 135-horsepower, diesel engine. Three smaller fishing boats, to be fitted with gas engines, are also under construction at the yard.

Geo. W. Kneass & Co., San Francisco, have lately built six surf boats for the Inter-Island Steam Navigation Company. These craft are heavily built, with fender strips along the sides, and can carry eight to ten tons of sugar through the surf out to a vessel at anchor. While heavy, they are so well designed that they are light enough to hoist aboard the steamer when cruising between ports.

This yard is rebuilding a 47-foot cruiser for Arnold Hasse, having added four feet to the length at the stern, quite a neat bit of work from a builder's point of view. A new Hall-Scott, 2 to 1 reduction gear, 175-horsepower engine will be installed, which will give the remodelled craft high speed.

A 26-foot cruiser, fitted with a 125-horsepower Scripps engine, for Mr. Westphal, is to be a sensation in cruiser types. George Kneass says she is to be of full teak and copper fastened construction, with all latest and some new improvements in design and finish.

John Twigg & Sons, San Francisco, have completed and sold several of their new type of seagoing outboard cruisers. These small craft are able and can be made speedy if maximum power is installed. They are 20 feet over-all by 5 feet 7 inches beam. Draft is 9



This picture shows the new improved vertical winch for hauling seines.

This winch was developed and built by Olson & Sunde Machine Works of Seattle and is the result of long experience in the handling of practical fishing problems. It may be operated by either a small electric motor or by shaft, gear, and clutch from the main engine. This winch has been receiving much favorable comment from Puget Sound fishermen.



Captain F. E. Craig and Chief Engineer R. F. Nelson of the Columbia River pilot boat Columbia.

inches, enabling them to go into bays and inlets where deeper vessels cannot enter. A deckhouse, fitted with sleeping accommodations for three persons and day space for six, is provided. Hull construction is of the well known Twigg quality, and these little boats should be quite the thing for week-end trips to the many points of interest near San Francisco. The cost, including outboard motor, is about what would be paid for an ordinary automobile.

Bundeson & Lauritzen, at Pittsburg, California, will soon launch the two ferry boats building for the San Joaquin County supervisors for use in the Delta Island district. These boats are 50 feet by 20 feet, open deck, and will be of the "drag line" propulsion type, with a stationary Fairbanks-Morse Z-style engine for power. This engine operates a drum around which a cable fixed from bank to bank is wound, hauling the craft along at a fair speed. The boats will carry 12 automobiles at a time, besides passengers.

Besides the ferry craft building, the yard is busy at general repairs on workboats and dredgers. The machine shop of the plant keeps a force of iron workers employed as well. The management report business as fair with prospects good.

F. L. Fulton's yard, at Antioch, has just started a freight boat for the Nichols Transportation Company at Stockton. This vessel will be 70 feet in length by 28 feet beam, with an "overhang" of four feet. She will be propelled by two sets of 4-cylinder Atlas-Imperial diesel engines of 65-horsepower each, driving twin screws, and should develop around 11 knots speed.

General repairs have kept the yard busy the past winter season, and besides the freighter in hand several new jobs are being planned.

Colberg's Boat Works, Stockton,

and being a smaller job, it is done by the same outfit, with the same crew. The machine is used by the following companies: California, Pacific, and others. The machine is used by the same outfit, with the same crew. The machine is used by the same outfit, with the same crew.

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Stephen T. Moore, president of the company, says that the machine is used by the same outfit, with the same crew. The machine is used by the same outfit, with the same crew. The machine is used by the same outfit, with the same crew.

Geo. W. Ingersoll, owner of the machine, says that the machine is used by the same outfit, with the same crew. The machine is used by the same outfit, with the same crew. The machine is used by the same outfit, with the same crew.

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Small motorboat on the water.

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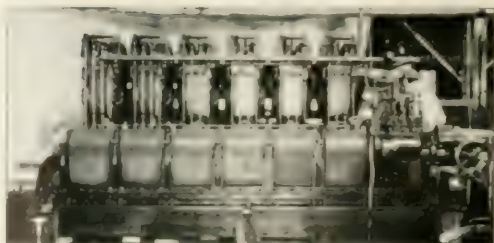
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At the left is shown the freighter Merrimack, owned by the Merrimack Chemical Company of Boston. This craft is 144 feet long by 22 feet 8 inches beam by 11 feet 3 inches draft, 301 gross tons. She is propelled by the 400-horsepower, six-cylinder, directly reversible, Standard full diesel engine shown above. The engine was built by the Standard Motor Construction Company of Jersey City, New Jersey.

A New Auxiliary Yawl Design

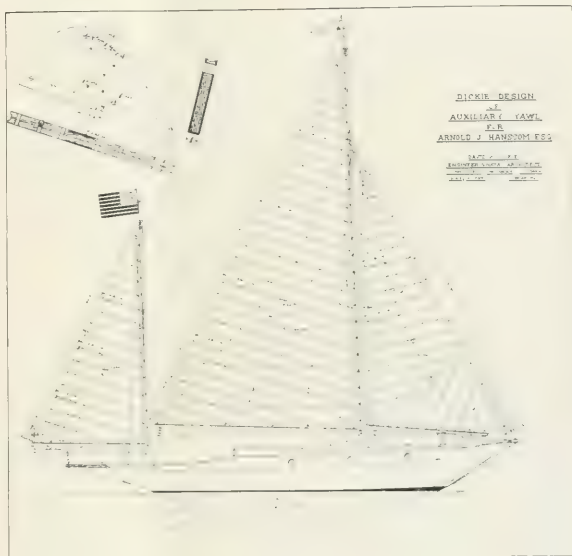
By David W. Dickie

THE drawings show an auxiliary yawl for Arnold J. Hanscom which the owner is now building at the United Ship Repair Company, San Francisco, for cruising in the southern end of San Francisco Bay and up the Sacramento River.

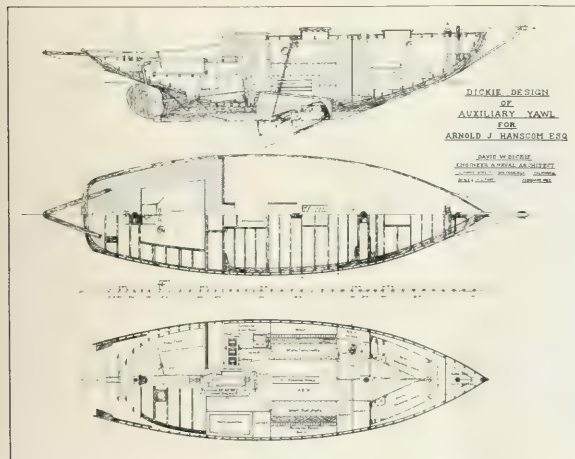
One of the main requirements was the limitation of draft necessary to cruise in the shallow waters of the San Francisco Bay region, and this requirement involved stability considerations that would admit of the vessel taking the bottom and righting herself when the tide came in without flooding the cockpit and cabin.

The principal characteristics are as follows:

Length overall, hull	40' 0"
Length, overhang stem	4' 7"
Length, waterline	30' 0"
Length, overhang stern	5' 5"
Displacement length	30' 0"
Beam, over planking	12' 0"
Beam, molded frames	11' 8 1/2"
Crown amidships	8" in 12' 0"
Crown quarterdeck	3" in 12' 0"
Draft forward	3' 9 1/2"
Draft rudder stock	4' 3"
Draft centerboard	6' 9"
Keel outside rabbet	10 1/2"
Cast iron ballast, pounds	5088



Outboard profile and sail plan of new auxiliary yawl.



Inboard profile and general arrangement plans of new auxiliary yawl.

Freeboard, lowest sheer	3' 0"
Freeboard, stem	4' 8"
Freeboard at stern	2' 5 1/2"
Sheer forward	1' 0"
Sheer aft	3"
Depth keel to top of deck beam	6' 4"
Height foremast step to truck 50' 7"	
Height spanker step to truck 30' 0"	
Length staysail boom	15' 10"
Length fore boom	21' 9"
Length spanker boom	12' 4"

The vessel is of yawl rig having a raised deck forward, a quarter deck aft, and a cockpit. The model is of the Gloucester bow, elliptical transom stern type with hollow heel aft. The arrangement of space is clearly indicated on the drawings. Provision is made to stow a full standard block of ice in the refrigerator with space below for perishable food. The upper door is hinged on the bottom and acts as a shelf to receive the ice cake, thus permitting the cake to be slipped into place by raising the door.

The galley is on the port side

with frog and three-toed sloth. The sloth could be regarded as an arboreal ape in the making, all of the more. The ape will never become a frog or a sloth, but the sloth does have many features that the ape lacks.

[illegible]

board

The authors are indebted to Dr. J. D. Hoffman for his helpful criticisms of the manuscript.

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and an improved soil tiller distribution
percentage. The growing time for
these factors will vary with
the growth rate and the time

Journal of Interpersonal Violence 25(12). This journal is indexed in 14 systems of book data, among 25 other data sources, of free access of free content.

* Treatment of mixed infections may
involve the use of more than one anti-
parasitic drug. Consult your veterinarian.

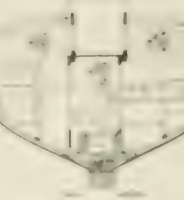
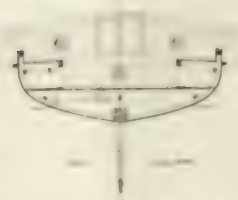
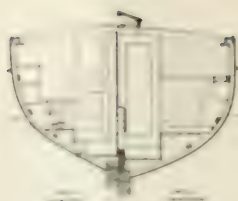
The mainmast is handled by a separate derrick, the deck is the better to avoid having to handle it from the deck when the mainsail boom is up & down.

The fire extinguishing apparatus is arranged to allow access from the outside to flush the piping and control valves and supply is provided for through the hatch over the forward stowage.

The companionway, forward hatch, and port lights are fitted with screens to shut out insects, be left open in hot weather without disturbance from flies and mosquitoes. The bowsprit is fitted to stow the anchor and thus keep the deck clear.

hold for the shaft through the throat; one arm of knee goes under the horn timber and the other takes the keel and lower deadwood. The use of the knee permits the forward edge of the propeller well being trimmed to facilitate getting the water to the propeller and so increase propulsive efficiency.

The anchor windlass will be a Cunningham ratchet windless suitable for the job. The anchor is a wildcat and gypsy on each side. All



Journal of Management Education 32(10)p.1039-1054

and the numerous birds, including jays, that were everywhere on the trail were no exception to this rule. The entire area had a great time in celebrating another New Year's Festival. And then the evening gave us another beautiful opportunity: the development of which was naturally caused by the burning and burning conditions of the night. The interesting typical development in New York. And the very next day. When the conditions were quite good and the typical typical, several studies were tried to improve, good and good conditions. But it was not

[Go back to the top of the page](#)

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Diesel Ferry Shows Economy

The latest ferry to be added to the line to the Tacoma, Seattle and Everett routes is a double end drive automobile ferry.

which are being ob-
this diesel engine ferry
are strikingly shown in a statement
by Mr. Skansie, president and prin-
Navigation Company. In comment-
ing on the performance, he said,
"The City of Tacoma with her
steam equipment used approxi-
mately 720 gallons of fuel per day,
while the ferry Defiance, which is
equipped with a 360-horsepower
Fairbanks-Morse diesel engine,
uses less than 100 gallons per day."

Defiance, Tacoma, and Gig Harbor. The round trip between these two points makes a 7½-mile run with two stops. The fuel consumption is 14 gallons per round trip, and the lubricating oil averages one gallon every four hours running time. The winter schedule consists of seven round trips per day, while the summer schedule, effective seven months of the year, consists of fourteen round trips per day.

The Defiance has an overall length of 165 feet, the greatest beam is 51 feet, and the draft light is 8 feet 6 inches, while the gross tonnage is 443 and the net tonnage

With an engine speed of 252 revolutions per minute the vessel made a speed of 8.01 knots with a twenty-mile-an-hour wind and 7.81 knots against the wind.



Auxiliaries•Ship Supplies•Marine Equipment

The Seventh Golden Gate Diesel-Electric Ferry

By Thomas Neely, General Engineer,
Westinghouse Electric and Manufacturing Company.

THE Golden Gate Ferry Company of San Francisco recently put in service its seventh diesel-electric ferryboat. During 1927 three new ferries of this type were completed for this company, the first three having been in service prior to that time, while the seventh has just been built. This is convincing evidence that the Golden Gate Ferry Company has found diesel-electric equipment to be more economical and reliable than other types of propulsion for this service.

The electric propelling equipment and electric auxiliaries for the three boats placed in service in 1927—namely, Golden Bear, Golden Shore, and Golden Poppy—were furnished by the Westinghouse Electric & Manufacturing Company and the diesel engines by the Ingersoll-Rand Company, and the seventh, the Golden Age, is a repeat order for practically duplicate equipment. The electrical machinery is built in accordance with the most modern engineering practice, and the propelling equipment and auxiliaries are designed and built to meet the exacting requirements of marine service.

In these ferries, two motors are used, each of which will deliver 950 horsepower to the propeller shafts when operating at a speed of 180 revolutions per minute. These are located at opposite ends of the boat and are rigidly coupled to the propeller shafts. They are of the open type and are mounted on bed plates in order to provide a rigid foundation, the hulls being of wood. Each motor shaft is supported by two pedestal type marine bearings, lubrication being obtained by a central disc which dips into the oil well. The oil is deflected to each side by a special arrangement. By this means ample lubrication is assured, regardless of the speed or direction of rotation.

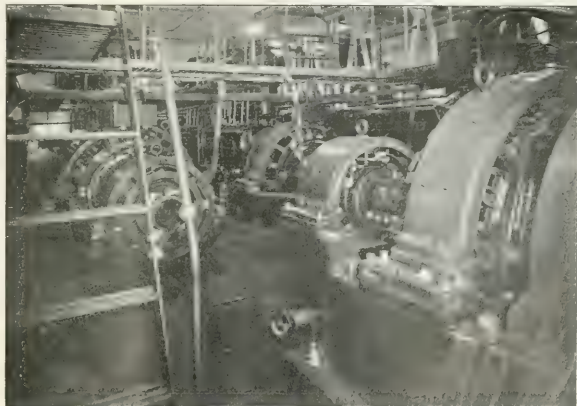
Three main generators and three

exciters are used on each boat. One main generator and one exciter, together with one of the three diesel engines, compose an engine generator set. The generators and exciters are similar in construction to the propelling motors and each exciter armature is overhung on an extension of the generator shaft. Each main generator is rated at 270 kilowatts, 250 volts, and each exciter, which is also used for auxiliary power, is rated at 30 kilowatts, 115 volts.

The control arrangement is such that the three main generators are connected in series with one propelling motor, the second motor being in parallel with the first. A generator set-up switch is provided for each main generator. These are used for removing any one or more generators from the propulsion circuit and completing the series circuit with the remaining machines. By means of a system of rheostats and contactors, which are actuated by auxiliary contacts on the controlling reversing rheo-

stat, the after propelling motor automatically has weakened field established, thereby causing it to operate at a higher speed than the forward motor. This causes the after motor to propel the ferry and the forward motor to rotate at "slip" speed as previously mentioned.

A double face-plate potentiometer type rheostat is used at each control station for controlling the generator field excitation, thereby controlling the generated voltage and the speed and direction of rotation of the propulsion motors, the motor fields being shunt wound and separately excited, at a constant potential. A hand wheel on the engine room switchboard is used for operating the engine room rheostat, and a pedestal is provided in each pilot house for operating the pilot house reversing rheostats through a shaft and bevel gears, from a lever on the pedestal. A system of transfer switches is provided for selecting the control station desired for use.



Engine room of the Golden Gate Ferry Company's diesel-electric ferry Golden Bear, featuring Ingersoll-Rand diesel engines and Westinghouse generators.

Auxiliary Compressors

THE rapid advance in diesel engine use for workboats has created a demand for a small but efficient auxiliary air compressor for starting air. These machines can also be utilized for other purposes requiring compressed air and may be combined with the operation of pumps or dynamos from the same power source.

Such an auxiliary compressor should embody special features of design and should also be exceptionally well made to insure a steady performance under conditions at times very rough and exacting. The crew of a workboat is small. Many carry but one man, who is pilot, engineer, cook, deckhand, lookout, roustabout, and general utility boy. So it will be seen that all units of a workboat must be capable of effective performance with minimum of attention.

The Rix Company of San Francisco has lately brought out a line of small compressors especially adapted for use in small vessels of the workboat type. The manufacturer has for some fifty years been identified with air compressor building and it is claimed that this latest product is about the last word in efficiency and sturdiness. The machine is built in two models, one to handle air at 250 pounds pressure for starting, the other type to deliver injection air up to 1500 pounds.

These machines are wholly of California construction excepting the carburetor and magneto, which

are obtained from the best specialists in their lines of manufacture. Careful inspection and exacting tests are made on all machines before they leave the shop floor, and when shipped they are guaranteed to hold up to their work and deliver the specified volume and pressure of air. The machines are very compact, but at the same time easily accessible, an advantage of much importance in marine installations.

A two-stage compressor and its driving gasoline engine occupies a space of 33¼ inches length, 18¼ inches width, 30½ inches height, and will deliver 10 cubic feet of air per minute at a pressure of 1500 pounds with revolutions of engine 600 per minute. To insure that these units shall perform as stated, volumetric meters are employed in testing, as well as very exact measurements of pressures. To make the machines better fitted for marine use, the cooling water is circulated by a solid bronze pump of large capacity. The shafts and connecting rods are very heavy for the size of machine, and especial attention is given to balancing, insuring a very quiet running job.

Besides these small compressors, the Rix Company builds many heavier and higher capacity types for marine, mining, and industrial purposes, both in motor and direct engine drive, all with the guarantee of a firm which for a half century has been identified with successful air compressor design and construction.

Powell Star Valves

STREAM lines, which years ago were made famous by clipper ship builders, have become vogue in modern machine design. Automobiles and airplanes are constructed with a view to keeping the stream line effect, and even the modern flapper has adopted the idea as one to enhance her attractiveness. But the fashion has now been taken up by staid and hard-headed manufacturers of metal units, and the beauty and grace of stream line effect has been embodied in the new Powell Star valves.

This latest product of the Powell factories attains grace with no sacrifice of strength or rigidity. In fact, the new valve design enhances these requisite qualities and de-

velops a better valve that is also better looking. The great ship Malolo is fitted throughout with Powell valves of this model.

Among the latest types that Powell has put on the market are the electric steel body valves, made to safely carry from 300 to 900 pounds of steam pressure. Fitted with monel and stainless steel trimmings, these valves are believed to be fully able to cope with all the many new demands due to rising steam pressures and high superheats.

S. S. Brooks, representative of the Powell Valve Company in San Francisco, will gladly give full details of this new line of valves to those interested.

Naval Engineers' Medal Awarded

THE medal of the American Society of Naval Engineers was recently awarded to Henry F. Schmidt, consulting engineer of the Westinghouse Electric & Manufacturing Company, South Philadelphia Works, for the best article submitted during the year 1927. Mr. Schmidt, besides being awarded a gold medal, was given an honorary life membership in the society and a cash prize for his excellent and well illustrated paper entitled "Some Screw Propeller Experiments, with Particular Reference to Pumps and Blowers."

The presentation of the awards to Mr. Schmidt was made by Secretary of the Navy Wilbur at the annual dinner of the society which was held at the Willard Hotel, Washington, D.C.

Mr. Schmidt was born on June 21, 1880, in New York City. He attended Columbia University, where he studied marine engineering under the late Professor W. L. Cathcart, Commander U.S. Navy. After leaving college, he worked for some time on the turbine test floor at the works of the General Electric Company. For two years thereafter he was employed as a supervising engineer. In 1905 he accepted a position as lecturer at Queen's University, Kingston, Ontario, continuing in this work until 1906, when he accepted an appointment as instructor of mechanical engineering at the Michigan Agricultural College.

Mr. Schmidt next turned his efforts to editorial work, and during 1907 was assistant editor of *Electrical Railway Review*. In 1908 he joined the Westinghouse organization in the capacity of assistant technical writer. He is an inventor of note, having obtained over ninety patents. A number of these cover designs incorporated in propelling machinery built by the Westinghouse Electric & Manufacturing Company for United States naval vessels.

Saving the Fish Nets

April Pacific Marine Review had an article recommending copper-plate for preserving cordage exposed to sea water. That brought enquiries as to where this compound can be obtained. Weeks-Howe-Emerson Company, San Francisco, are California agents. The preparation is manufactured by Woolsey Paint Co. of New Jersey.

First Official Test of Marine Economizers In Ocean Service

DURING the past few years, the Chinese government has been making a concerted effort to improve the country's infrastructure, particularly in the areas of transportation and communication. This effort has been part of a broader strategy to modernize the economy and attract foreign investment. The government has invested heavily in building roads, bridges, and highways, as well as in developing the telecommunications sector. These investments have helped to reduce the time and cost of moving goods and people across the country, which has in turn stimulated economic growth. The government has also been working to improve the quality of its infrastructure, by upgrading existing facilities and introducing new technologies. This has helped to make the infrastructure more reliable and efficient, which has further encouraged investment and trade. Overall, the Chinese government's efforts to improve its infrastructure have been a key factor in the country's economic success in recent years.

Shrub: 4-6 m. flowers a little larger than berries, more or less white, with a little bluish tinge; ex. fruit small, red, covered with numerous, but short, hairs, growing up to 10 mm. long; young berries had a reddish brown yellow colour. *Fr. 1000* (1000)

Two possible solutions existed, one more efficient than the other. The first was to continue the use of the traditional method of increasing the boiler efficiency, which have proved to be successful in power plants, and to permit access to the Mississippi River. The latter course was decided upon and the necessary bill of amendment passed on a typical day.

This steamer is 410 feet long, 55

[illegible]

of 20 ft. The plant consists of a thick, rounded horizontal stem growing from the ground 10 to 15 inches with 12 to 15 leaves 4 to 6 in. long and 1 to 2 in. wide. The leaves are furrowed on the upper surface and smooth on the lower. The flowers are small and white, and the fruit is a small, round, green berry.

monument were featured in such
media. The history was filled with
hazy old pictures of American Indians
and an occasional, soft-focus, white
woman. Native women like me, I
felt, should make you proud for their
courage, endurance, strength, but we
don't have history books around.

Pharmaceutical Research and Development

A 1987 report from Foster marine, supplying information that is critical to the process.

The 1996 Murray study found that the peak occurred at about 11.5% of the life span.

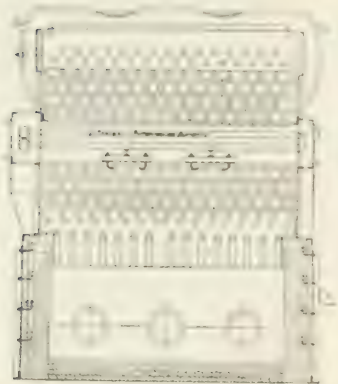
These requests must make it as simple as possible for the foreign investor to file.

4. From the perspective of law, the fact that copyright is the first step in the process of the state's intervention in the market is not sufficient to justify its use as a means to achieve other goals, such as the promotion of culture.

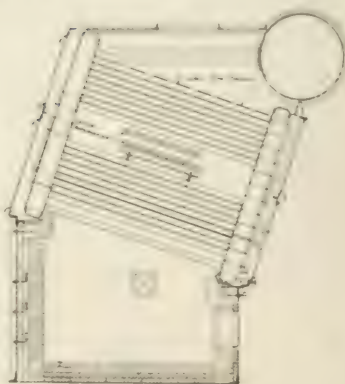
3. *Artemisia*. The species consists of numerous plants of light greenish-grey and long-stemmed up to the dense, bushy, upright.

3 Reduce the draft loss through the boiler heating surface and render a greater portion of the heating surface effective.

4 Recover the maximum amount of heat from the flue gases through



Flattened and long, human anatomy of hand is reversed for grasping an additional weight the extra muscle. Original flat, the long unopposed big toe holds the foot flat on the top of the ball surface and there are fingers extended the foot in motion when the toe is not built.



would, at the same time, preheat the boiler feed water, thus reducing the amount of work to be done in the boiler and the amount of back pressure to be carried in the feed water heater.

5. Eliminate soot pockets in the boiler.

The economizer consists of 160 2-inch tubes 8 feet long, upon which are shrunk cast iron gilled rings which increase the heat absorbing area to six times that of the bare tube. The economizer is fitted with soot blowers for keeping the surface clean and during the trial trip these were tested out and found to be very efficacious and the economizer sensitive to their use.

Prior to the alterations the City of Joliet made $9\frac{1}{2}$ knots on a consumption of 190 barrels a day, using twelve burners fitted with No. $3\frac{1}{2}$ tips. During the trial trip the nine burners now installed carried the load with the same size tips, the temperature and pressure of the oil being about the same.

Analysis of the fuel oil made after the trial shows:

Before Trial

Carbon	76.64
Hydrogen	10.66
Sulphur	1.96
B.T.U.	16595 (high)
B.T.U.	15665 (low)
Water	9.8%
Baume	16.3° (A.P.I.)

After Trial

Carbon	78.96
Hydrogen	10.88
Sulphur	2.05
B.T.U.	17148 (high)

B.T.U. 16197 (low)
Water 7.4%
Baume 15.1° (A.P.I.)
Specific gravity at 20.5°C = 0.954

The change in the boiler baffling was distinctly beneficial as shown by the low exit gas temperatures from the boiler. In this connection it should be pointed out that whereas the original baffles were designed to effect a specific path of gases across the heating surface they undoubtedly concentrated the heat transfer at some points and left other portions ineffective. The new baffle does not produce a high velocity across the heating surface at certain points but renders all of the surface effective to an extent determined by the velocity of gases through the boiler as a whole.

During the trial trip of six hours all of the auxiliaries were operated and steam was carried on the deck lines for the purpose of providing the maximum possible load on the boilers. On the run back to port the engine was operated at 96 revolutions per minute and it was generally conceded that not only was the steam consumption under these conditions all that would be required when the vessel is fully loaded but that an additional steam production of at least 25 per cent could be counted upon. The engine was operating on superheated steam having an average of about 50 degrees of superheat. It functioned most satisfactorily and without any cylinder lubrication.

It will be noticed that the fan was run at only about 200 revolutions

per minute, and it seems probable that increasing the height of the stack to that corresponding with ordinary peace-time practice would provide this steamer with sufficient draft so that the induced draft fan could be shut down. A further step in line of economy would be to operate the auxiliaries upon moderately superheated steam as is used in the main engine. This would, no doubt, reduce the steam consumption of the ship considerably.

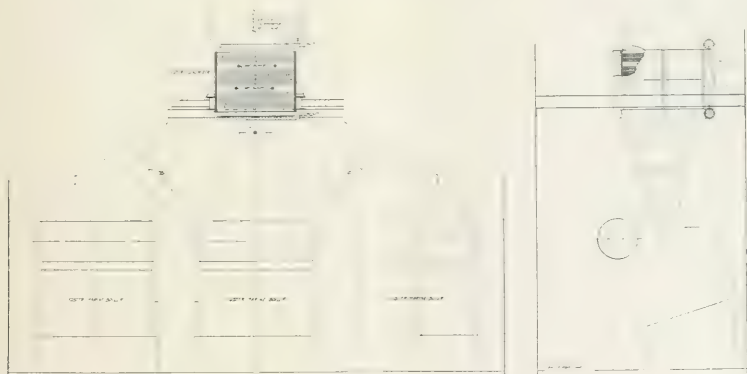
Fathometer a Favorite

THE greatly increasing use of echo depth sounders is borne out by the fact that a large number of vessels now under construction in the United States and abroad are being equipped with Fathometers.

Fathometers have been specified for the Mellon, Bush, and Behrend yachts building at the Krupp yard, Kiel, Germany, as well as for the Crane yacht building at Lussin Piccolo, Italy.

Five Coast Guard cutters to be built at the Bethlehem Plant, Quincy, Mass., are to have Fathometers, as are the Fleischman yacht at Lawley's shipyard and the Baker yacht at Newport News.

This thoroughly modern sounding instrument is now in use on all classes of vessels.



Drawing showing cross section and longitudinal elevations of boiler and economizer installation on the steamer City of Joliet. It will be seen that the economizer receives gases from all three boilers, but that each boiler has its individual damper, thus giving absolute control of the operating conditions in each furnace. An induced draft fan is located above the economizer.

Pacific Port Construction Notes

Alameda ports immediately adjacent to each other. The first of these is the new 10-acre site on the west side of the inner harbor at the San Francisco Bridge Co. and will build a \$750,000 plant and shipping terminal.

San Francisco. Henry Francis Construction Co., Inc., of San Francisco, has prepared plans for the Port of San Francisco Commission for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods and will be used for the storage of goods.

The pier will be owned by the Port of San Francisco, Inc., and will be used for the storage of goods and will be used for the storage of goods and will be used for the storage of goods.

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Richmond. The City of Richmond, Calif., has awarded a contract to the Richmond City Council for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

The pier will be owned by the Port of San Francisco, Inc., and will be used for the storage of goods and will be used for the storage of goods and will be used for the storage of goods.

Oakland. Port Commission has announced that Rosenberg Brothers & Co., of San Francisco, reputed to be the world's largest dried fruit packers, will locate a central shipping terminal on the West Oakland waterfront. The port will start immediate construction of warehouses to cover four and a half acres.

Los Angeles Harbor. The harbor commission has announced that the proposed California Pacific Long and Short Line (CPLSL) has been approved by the Federal Reserve Board. The CPLSL will be a 1,000-foot pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

Alameda. The Harbor Commission has announced that the proposed California Pacific Long and Short Line (CPLSL) has been approved by the Federal Reserve Board. The CPLSL will be a 1,000-foot pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

Seattle. The Seattle City Council has approved a plan for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

The pier will be owned by the Port of San Francisco, Inc., and will be used for the storage of goods and will be used for the storage of goods and will be used for the storage of goods.

Oakland. The City of Oakland, Calif., has awarded a contract to the Oakland City Council for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

The pier will be owned by the Port of San Francisco, Inc., and will be used for the storage of goods and will be used for the storage of goods and will be used for the storage of goods.

New Westminster, B. C. The City of New Westminster, B. C., has awarded a contract to the New Westminster City Council for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

The pier will be owned by the Port of San Francisco, Inc., and will be used for the storage of goods and will be used for the storage of goods and will be used for the storage of goods.

Callao, Peru. The Frederick Shure Corporation of New York is reported to have obtained a contract from the Peruvian government for extensive port developments to be built at Callao.

Washington Alaska Transportation Co., Seattle, has been formed by Chas. R. Smith and associates to operate freight and passenger service between Puget Sound and Alaska. The steamer Santa Ana has been purchased.

Long Beach, California, will hold a motor boat show July 27 to August 13 during the annual regatta of the Southern California Yachting Association. Henry B. King and Dick Loyne will be in charge.

Oakland Harbor Commission. The Oakland Harbor Commission has announced that the proposed California Pacific Long and Short Line (CPLSL) has been approved by the Federal Reserve Board. The CPLSL will be a 1,000-foot pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

San Francisco. Henry Francis Construction Co., Inc., of San Francisco, has prepared plans for the Port of San Francisco Commission for the construction of a new pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

Alameda. The Harbor Commission has announced that the proposed California Pacific Long and Short Line (CPLSL) has been approved by the Federal Reserve Board. The CPLSL will be a 1,000-foot pier to be built on the western side of the city and to have a length of 1,000 feet and a width of 100 feet. The pier will be used for the storage of lumber and other goods and will be used for the storage of goods.

Neurology

CARL D. BRADLEY, president of the Marine Transportation Company and the Marine Transportation Company, died recently of a heart attack at his home in San Francisco, Calif.

Carl Bradley has been prominent in the transportation of limestone on the West Coast and the transportation of limestone in the Pacific Northwest. He has been prominent in the transportation of limestone on the West Coast and the transportation of limestone in the Pacific Northwest. He has been prominent in the transportation of limestone on the West Coast and the transportation of limestone in the Pacific Northwest.

Bradley had the satisfaction of seeing his company's development completed and in satisfactory operation.

Eliphalet Platt Stratton, retired marine engineer, naval architect and inventor, died recently in his 83rd year. He was connected with the George Quintard Iron Works of New York and the New York Mail Steamship Co. He also was chief engineer for the New York and West Indies Steamship Co., and an inspector of steam vessels for the Port of New York Authority. For a time he was chief engineer of the American Bureau of Shipping and a member of its board of governors.



Marine Insurance

Edited by JAMES A. QUINBY

Optional Stowage Upheld

IN the case of Davidson & Strauss versus the steamship Carriso, decided on April 2 and as yet unreported, Judge Kerrigan of the Federal District Court for the Ninth Circuit has handed down an opinion upholding the validity of a bill of lading clause giving the ship owner the right to stow any and all goods either on or under deck.

While the "optional stowage" clause has been well known in British bills of lading for many years, this is the first time that the validity of such a provision has been questioned in an American court. The opinion follows:

"This is a libel for damage to certain cork board shipped from Lisbon to San Francisco as deck load on the motorship Carriso. The cork board arrived in a damaged condition, the damage being due to sea water. The bill of lading provided that the ship had 'liberty to carry the goods and any other goods on deck or under deck.' Libelants urge that this clause is invalid because it is in conflict with the Harter Act and deprives the shipper of his right to recover for cargo damage under that act. They also contend that, if the option for deck stowage be construed to be valid, respondents are nevertheless liable for improper stowage, in view of the known nature of the cork board and its suscepti-

bility to serious damage if brought into contact with sea water.

The evidence shows that the cork board was crated and that it was dunnaged except as to the portion stowed forward, where the mate considered, properly I think, that it was hardly likely that the ship would take water. The mate also testified that complete dunnaging would not have prevented the damage. Under these circumstances I can not hold respondents liable for improper stowage, assuming the bill of lading clause permitting the deck stowage to be valid. Armour & Co., Ltd., versus Walford, 28 Com. Cases 37.

Libelants cannot recover, therefore, unless the bill of lading clause in question is invalid. Armour & Co., Ltd., versus Walford, supra, is not authority supporting the validity of this clause in view of the fact that there is in England no statute similar to the Harter Act controlling the decisions of the courts. I am nevertheless of the opinion that the clause is valid and not in conflict with the Harter Act. It accords with an old maritime rule that cargo may be carried on deck with the consent of the shipper. Lawrence versus Minturn, 58 U.S. 100. Such stipulation is not expressly barred by the terms of the statute. Being valid under American law before the Act,



Alaska Packers' bark Star of England putting out from the Golden Gate, Alaska bound, April 3, 1928.
Phot. by Spang and Hermon

WANING STARS

With tops'ls set and bulwarks wet and breakers hard a'lee
The old Alaska Packers' fleet is putting out to sea.
Their decks a'lit to driven spray, as south'ard off the Gate
They roll their course for gray-green leagues to seek the
winds of fate.

A'down the last horizon—beyond the steamer lanes,
Where smoke and steel are sacrilege, and only God
remains.
There is a world that reaches back to days that used to be;
The golden days when these tall ships were masters of
the sea

Again—perhaps the last time—they plow the off-shore
track
From the fogs of Point Bonita to the rocks of Kodiak.
Ye ghosts of Spanish galleons and clipper ships with tea
Dip colors!—Your survivors are passing from the sea.

—J. A. Q.

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FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

and the insurance company are engaged in a battle to determine who shall be held liable for the loss. The insurance company is the one who is in the wrong.

And a person who is in the wrong is not liable for the loss. The insurance company is the one who is in the wrong.

Not in Conflict with Harter Act

The court in its opinion stated that the contract between the ship owner and the cargo owner is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act.

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prior to the Harter Act, is valid

While the amount involved is comparatively small, the court in its opinion stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act.

It would follow that perishable commodities might be stowed next to the engine room and the vessel might nevertheless evade liability for damage thereby caused.

The decision is one which should be of great interest to ship owners and P. & I. insurers. Conversely, it should be of great interest to cargo owners. The court in its opinion stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act.

Policy Reformed

Using special risk marine policies by means of riders attached to ordinary policy forms has received a severe set-back in the case of the Daniel J. Dugan 1928 A.M.C. 492.

The Insurance Trading Company, whose insurance policy was involved in the case, was a company which had been organized in 1900. The company was organized in 1900. The company was organized in 1900. The company was organized in 1900.

The court in its opinion stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act.

With the case thus set for a hearing, the court in its opinion stated that the contract is not in conflict with the provisions of the Harter Act. The court stated that the contract is not in conflict with the provisions of the Harter Act.

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Policy Holder Prevails

In upholding the contention of the assured, the court comments in part as follows:

"We have therefore a solemn agreement between the assured and the plaintiff's agent that the plaintiff shall be insured against fire for an amount not to exceed \$5000 and that in the event of a loss the plaintiff shall be so insured against fire, a full fire premium charged and paid, and yet, when the policy is delivered, the defendant has placed thereon a little rubber stamped clause which changes both the policy and the expressed intent of the defendant to a non-fire coverage. There is no evidence of any assent by plaintiff to such a proposition.

All the witnesses both for the plaintiff and defendant assert that it was not intended to so change the form of policy. It is extremely plain that the plaintiff wanted and paid for fire insurance, and that the agents of the defendant so understood and considered the policy, as it now stands to cover a fire loss, and intended it so to cover.

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
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LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

The evidence is clear and convincing on this point.

Moreover, the acts of the parties after the fire had occurred are not only not inconsistent with this expressed intention, but are most persuasive that such intention was the real intention of the parties. This is shown by plaintiff's notice to defendant on June 28, 1926, as to the fire. The survey of damage duly participated in by defendant on July 13, 1926. The master's protest touching the casualty, forwarded with a letter to defendant. These were either done or received without any protest or objection, of any kind, on the part of the defendant. The proof indicates plainly that at the time of the fire the defendant continued to consider that the policy covered a fire loss. The only controversy that appears is one concerning how the policy could be canceled, whether by one party or with the consent of both parties. This controversy occurred after the fire and was between an insurance broker and defendant.

In construing the intention of parties to a contract their acts are always relevant and quite persuasive. *Nicoll versus Sands*, 131 N. Y. 19; *Manhattan Life Ins. Co. versus Wright*, 126 Fed. 82; *Brooklyn L. Insurance Co. versus Dutcher*, 95 U. S. 269.

Thus we have a situation where the parties plainly intended one thing and the written contract between them not only expresses something entirely different, but plainly avoids one of the main purposes of the agreement. This departure from the real intention of the parties has been caused by the act of one or both of the parties, intended to do one thing but not intending to do the thing that caused this departure from the real intention of the parties.

As has been said, 'it is well settled that courts of equity will reform a written contract where, owing to mutual mistake, the language therein did not fully or accurately express the agreement and intention of the parties. The fact that interpretation or construction of a contract presents a question of law and that, therefore, the mistake was one of law is not a bar to grant relief.' *Philippine Sugar, etc. Co. versus Philippine Islands*, 247 U. S. 385, page 389; citing *Snell versus Atlantic F. & M. Insurance Co.* 98 U. S. 87; *Griswold versus Hazard*, 141 U. S. 260.

In considering such a situation and aside from the testimony of the witnesses, and the legal effect of the rider and stamp, I cannot be expected to ignore the plain purpose of the parties in entering into the contract and express 'intent of the defendant' in the original policy to insure against fire. This expression of intent is neither a 'term' nor a 'condition' of the policy.

'In a suit to reform a contract the burden of proof

rests heavily upon the plaintiff, nevertheless, a chancellor or judge sitting in equity has abundant power to grant adequate relief, and in most jurisdictions speed relief, to an honest claimant who has been defrauded, deceived, or misled by the representative of an insurance company.' *Fitchner versus Fidelity Mutual Fire Assoc.*, 103 Iowa 276, cited in *McMaster versus N. Y. Life Ins. Co.*, 183 U. S. 25, page 39.

The evidence herein is clear and convincing. It presents no difficulty in finding that the placing thereon of the stamped clause in question, and the acceptance of the policy by the plaintiff, in view of the effect of the clause, was a clear case of mutual mistake of fact as well as of law. If this were not so the taking of the premium for a fire loss and the deliberate placing of the stamped clause thereon by the defendant, without notice of any kind or objection to the plaintiff, and in the face of its plainly expressed intention to the contrary, would be an absolute fraud on plaintiff."

Mixed Cargo

When the *Circinus* went ashore on the coast of southern California last year, her wireless operator sent out repeated calls for help, assistance, succor, or what have you. The *Koko*, one of Uncle Sam's noble ships, finally responded and asked for bearings. The bearings were duly given. Ensued a lengthy pause, during which we may visualize a solemn conference in the chart-room of the *Koko*. At last that vessel replied with a tentative suggestion.

"According to our reckoning," ran the message, "you are ashore."

"Yes," answered the *Circinus*, "we have been ashore for an hour and a half."

Which reminds us of the story Dave Young used to tell about the skipper and the chief engineer, each of whom thought the other's job a cinch. Finally they decided to trade places.

After spending a half-day with the engines, the erstwhile skipper decided to admit defeat. Streaked with grease, his fingers cut and bleeding, and his temper in shreds, he made his way to the bridge, to find the chief engineer reclining in a deck chair and nobody at the wheel.

"Great Scott, man," he shouted — (or skipperesque for them words), "Watch out! You'll have us ashore!"

"Nae, nae, mon," replied the chief (who, of course, was a German named Donnelly), "We hae been ashore for two hours."

Balfour, Kessler Agencies Inc.

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INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

The Association of Marine Underwriters Study Class, at its meeting of March 26 listened to Captain Leb Curtis of Pillsbury & Curtis, surveyors and salvage experts, on the subject of "Hull Salvage." The talk was illustrated by motion pictures furnished through the courtesy of Merritt, Chapman & Scott Corporation, showing in detail the salving of the steamship *Circinus* when that vessel went ashore on the coast of Southern California. The pictures, together with Captain Curtis' running comment, gave a very good idea of the use of ground tackle, the employment of the salvage tug *Peacock*, and the method of discharging cargo into lighters from a stranded vessel. A further reel showed steps taken to prevent the sinking of the tanker *Kekoskee* after a collision in Los Angeles Harbor; while still another film illustrated the operation of laying a large concrete pipe line in water for the City of Los Angeles.

At the same meeting the class was addressed by Thomas Roger Reed of the United States Weather Bureau, his subject being "Side-lights on Commercial Aviation." Mr. Reed stressed the necessity of observing the factor of safety in aerial travel, pointing out that we learn by mistakes on the ground, but in the air it is rarely customary to make more than one mistake.

Trade Literature

Westinghouse Safety Switches, Catalog 282, 1928 edition is now ready and will be mailed on request by the Westinghouse Electric & Mfg. Co., San Francisco, from any other branch office, or from East Pittsburgh.

The catalog is up to date in both equipment and prices and contains detailed description of all types of safety switches that may be required for any purpose. It is put up in a concise, understandable form, and bound with a brilliant scarlet cover, making it easy to find in a hurry.

The Brown Instrument Company, Philadelphia, has ready for distri-

bution the speaker also explained the operation of the weather bureau in providing mail fliers and others with data as to the weather conditions which they might expect in territory to be covered.

The underwriters at their meeting on April 9 gained a comprehensive bird's-eye view of the canned goods and dried fruit industry from A. M. Lester, vice-president of the California Packing Corporation, who discussed the history of the industry and the various difficulties encountered in keeping preserved products sound during ocean transit. Mr. Lester laid particular stress upon the preparation of containers and the necessity of shipping dried fruits in tin where the consignment is destined for a humid climate. He described the advancements which have been made in protecting such products, and sounded a note of hope that loss and damage would be minimized in the future.

Emmet J. Cashin, of the Shipowners' Claims Bureau, San Francisco, representative of the American Club, outlined the features of the ordinary protection and indemnity policy, describing the coverage of cargo claims, personal injuries, and miscellaneous claims which are met with under this familiar but generally misunderstood type of insurance.

bution Catalog No. 20 fully describing the many advantages found in Brown electric flow meters operated on the inductance bridge principle. These meters are available for service in metering the flow of water, gas, air, oil, or steam.

The E. T. Rugg Co., Newark, Ohio, has recently issued a very interesting booklet on **The Story of Rope**. This company manufactures manila and sisal rope, cordage, saddlery and automobile specialties. The little booklet tells the story of the manufacture of manila and sisal rope very attractively and contains many illustrations and drawings.

This firm also manufactures Oak-

um and is distributing an interesting little leaflet covering this material.

The Lincoln Electric Co., Cleveland, Ohio, has recently issued a catalog on **Lincoln Linc-Weld Motors**. These motors are of steel and made by the "Linc Weld" process. The catalog contains a complete description of their manufacture and parts, graphically illustrated.

Merchant Vessels of the United States, 1927 edition, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C.; price \$2.

It contains the name of every documented merchant vessel and yacht of the United States, approximately 28,500, the tonnage, dimensions, year, and place of building, service, and number of men composing the crew, together with the name and address of the owner. It shows separately the steam, motor, sail and unrigged merchant vessels and similarly, the yachts. It contains also the name of every documented merchant vessel and yacht which was lost, abandoned, sold to aliens, or removed for other causes during the year. There are lists of oil-burning steamers, vessels measured under Panama and Suez rules, vessels belonging to the Navy, War, Treasury, Commerce, Labor, and Interior Departments, the Panama Canal and Panama Railroad Company, and vessels owned in the Philippine Islands.

Ingersoll-Rand Company, of 11 Broadway, New York, has just completed the sixth edition of its popular 140-page, two-color book entitled, "100 and 1 Ways to Save Money with Portable Compressors."

In this book the company has embodied comparative cost data on its portable air compressors and air-operated tools (rock drills, paving breakers, clay diggers, backfill tampers, grinders, hoists, riveting hammers, chippers and metal drills).

Although no attempt has been made to establish large circulation figures, 125,000 of the books are already in the hands of readers. The fact that each copy in circulation represents a specific request indicates the genuine value of this publication. Free copies may be obtained by writing to Ingersoll-Rand Company, 11 Broadway, New York City, or any of its branches in any part of the world.

clam shell dredge and two steel dump scows. Proposals will be submitted as follows:

Proposal A—for detailing, constructing, and delivering the clam shell dredge in accordance with plans and specifications submitted by Harbor Board, to be built out of new material throughout.

Proposal B—For construction according to Harbor Board specifications out of used machinery specially reconstructed and put in first class condition and approved by Chief Engineer White.

Proposal C—for delivery of a new or used dredge of approximately the size and capacity called for in specifications.

Proposal D and E—for construction of two dump scows of steel or of wood.

New Freight Boat for Puget Sound

Another freight boat similar to the Belana, now under construction by the Western Boat Building Company, Tacoma, will be built for the Merchants Transportation Company of Tacoma, according to F. H. Marvin, president. The new freighter will be built on completion of the Belana.

The new vessel is to be 65 feet over-all, 28 feet beam, and 8 feet 6 inches depth, powered with two 75-horsepower diesel engines. The Belana is larger and will be equipped with 210 horsepower, directly reversible Fairbanks-Morse full diesel engine.

Shipping Board To Ask for Conversion Bids

Captain R. D. Gatewood, manager of the Maintenance and Repair Division of the U.S. Shipping Board, 45 Broadway, New York, is supervising the preparations of plans and specifications for the conversion of eight Shipping Board vessels to diesel drive. These will be ready for the shipyards about May 1.

The bids are to be submitted covering the conversion of 2, 4, 6, or 8 ships.

Contracts were recently awarded for auxiliary diesel engines for these vessels, twelve to be supplied by the Nordberg Manufacturing Co. of Milwaukee, costing \$426,840, and four to be supplied by the Fulton Iron Works Co. of St. Louis to cost \$107,232.

Passage of Jones-White Bill Would be Boon to Shipbuilders

A bill has been reported by the

House Committee on Merchant Marine providing for loans up to 75 per cent of the cost of construction of a ship in an American yard at the government rate of interest to be made to American ship owners, also ten-year contracts for carrying mail and provisions for enlisting seamen in the naval reserve with retainer pay to make up for the higher American operating costs.

If passed by Congress, this will be a much needed stimulus to American owners in the building of new vessels. The Matson Navigation Company, San Francisco, has already indicated that three vessels will be built under such a plan for operation between San Francisco and the Antipodes. The Export Steamship Corporation of New York has reported that they will construct new vessels under these favorable conditions for their Mediterranean service.

The Dollar Steamship Company of San Francisco is reported as having under consideration the building of a vessel each year until all eighteen of its vessels have been replaced.

Large Steam Yacht for American Owner

Henry J. Gielow, 25 West 43rd Street, New York, has received bids from six of the leading shipyards on the Atlantic Coast for the construction of a 310-foot steam yacht. If built, the yacht will be the largest afloat. She will have a beam of 44 feet and draft of 18 feet. Steam turbines developing 15,000 horsepower will give a speed of about 28 knots.

Large Yacht Planned

H. K. Scheel, naval architect of Los Angeles, is reported to be preparing specifications for the construction of a steel, diesel-powered yacht for a Pasadena client. The yacht is to be 125 feet long 24 feet beam, and 8 feet draft, powered with two 400-horsepower diesel engines. Auxiliaries will be diesel-electric driven, and accommodations will be provided for 16 guests in addition to the crew.

The Board of Harbor Commissioners, British Columbia, has authorized the construction of a combination workboat and police patrol boat for Burrard Inlet service.

West Vancouver Municipal Council has instructed Captain Arthur

Edwards, manager of the West Vancouver Municipal Ferry Service to make up a report on the cost of constructing a ferryboat to accommodate 350 passengers to operate between West Vancouver and Vancouver. The Council now operates two ferryboats on regular schedule.

Alaska Salmon Company, San Francisco, has purchased a lake-type freighter now at Dutch Harbor, Alaska. The vessel will be towed to San Francisco and converted into a floating cannery.

Steel Fishing Vessel Under Construction

The Los Angeles Shipbuilding & Drydock Corporation, L. E. Caverly, manager, with plant at San Pedro, California, has contracted to build the first steel fishing craft ever constructed on the Pacific Coast. The owners are Frank Theodora and Joe E. Asouca, backed by the San Diego Packing Company. G. B. Newby, naval architect of the shipyard, is designer of the craft. The boat will be 112.6 feet long, powered with 350 horsepower Atlas-Imperial diesel engine, to give a speed of 10½ knots.

The vessel will have five inches of ventilating air space between the steel hull and its cork insulation. It will have a cruising radius of 4000 miles. Cost will be around \$85,000.

REPAIRS

Moore Dry Dock Company, Oakland, California, has just completed repairs to the freighter Sagadahoc. The vessel was badly damaged in the bow coming through the Canal through failure of her steering gear. Eleven plates had to be renewed, five taken off and faired and replaced, and two faired in place. Four transverse frames were repaired and renewed and eleven longitudinals. The work was completed in seven days at a cost of \$21,000.

The Moore Dry Dock Company, Oakland, California, is building two caissons for the Coyote Point Bridge which will soon be under construction over San Francisco Bay connecting San Mateo and Alameda Counties. The caissons are 59 feet long, 26 feet width, 64 feet high. They will be built of strong, heavy timbers, and will each weigh about 187 tons. Two heavy wooden barges for this construction are to be 110 feet long, 34 feet beam, 9 feet depth.

Recent Shipbuilding Contracts

Station Island Shipbuilding Co. has an order from the Government for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year. The company is also working on a contract for the construction of two 100-ton barges for the Government, to be delivered by the end of the year.

The Chas. Ward Engineering Works, Portland, Ore., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

This work will be done by the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Vancouver Drydock & Salvage Co., Vancouver, British Columbia, is building at its 1,000-ton drydock a new 100-ton barge for a contract estimated at \$100,000. The barge will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year. The company is also working on a contract for the construction of two 100-ton barges for the Government, to be delivered by the end of the year.

Accommodations will provide for 8 men, and she will be equipped with all necessary equipment for a long voyage. The barge will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Delano Brassier, Long Beach, California, has received an order for two 117-foot 6-inch barge boats to cost \$80,000 each, to be powered with Fairbanks-Morse diesel engines.

Atlantic Bridge Company, Pittsburgh, Pa., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

American Electric Boat Co., Chicago, Ill., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Continental Shipbuilding Corp., Miami, Fla., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Hughes Shipbuilding & Dock Co., Seattle, Wash., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Drayton Contracting Co., Portland, Ore., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Midwest Marine Co., Chicago, Ill., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Nashville Bridge Co., Nashville, Tenn., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

San Shipbuilding & Drydock Co., Chester, Pa., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

SHIPYARD NOTES

The Oregon Shipyard, Portland, Ore., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

The Oregon Shipyard, Portland, Ore., has received an order from the United States Army for the construction of two 100-ton barges for a contract estimated at \$100,000. The barges will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

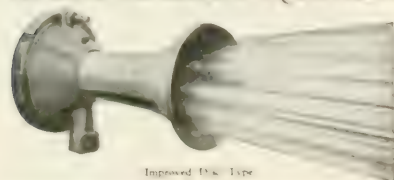
The concern contemplates the construction of a new 100-ton barge for a contract estimated at \$100,000. The barge will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

Rumors are coming from Los Angeles that the United States Army is planning to build a new 100-ton barge for a contract estimated at \$100,000. The barge will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

The new dry-dock to be built by the United States Army is estimated to cost \$100,000. The dock will be built at the company's plant at Station Island, Alaska, and will be delivered to the Government by the end of the year.

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Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of April 1, 1928.

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Steel dredge hull, for U. S. Smelting, Refining & Mining Co., Oakland, Calif.; 168x 60x12 ft., 10 cu. ft. buckets; deliver Apr. 16/28 est.

Three steel dredge hulls, sisters to above. 100x50x11'4"; 6 cu. ft. buckets; deliver Apr. 1/28 est.

Waialeale, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4 1/2"; loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 4000 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12' 268 sq. ft. heating surface; keel Nov. 15/27; launched Mar. 3/28; deliver June 1/28 est.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wn.

Hull 124, self-dumping gravel scow for Pioneer Sand and Gravel Co., Seattle; 100x 36x11 ft.; launched Oct. 5/27.

Crane, hull 125, patrol boat for U.S. Bureau of Fisheries, Seattle; 90 L.B.P.; 20 beam; 13'5"; loaded draft; 200 H.P. Washington-Estep diesel engs.

Northern Light, hull 134, twin screw cannery tender; for Northern Light Packing Co., Cordova, Alaska; 55 L.B.P., 13 beam.

Hull 135, fish scow for Alitak Packing Co., Seattle; 55 by 18 by 4 ft.

Hull 136, same as above.

Hull 137, fish scow for P. E. Harris & Co., Seattle; 60' long by 16' beam.

Hull 138, same as above.

Hull 139, pot scow for P. E. Harris & Co., 28'x10'x2'10".

Hull 140, same as above.

Hull 141, cannery tender for P. E. Harris & Co., Seattle; 76'x18' x8'6".

Hull 142, scow for Libby, McNeill & Libby, Seattle; 72'x24'x5'6".

LAKE WASHINGTON SHIPYARDS, Foughton, Wash.

Purchasing Agent: A. R. Van Sant.

Bainbridge, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P. 57' beam; 800 I.H.P. Washington-Estep diesel engs.; launch May 15/28 est.

Cannery tender for New England Fish Co., Seattle, 72' length; Washington-Estep diesel eng.; launched.

Purse seine boat for Dick Suryan; 72' long; 180 H.P. Washington-Estep diesel eng.

River boat for Capt. Frank Kern; 60' long.

PRINCE RUPERT DRYDOCK & SHIPYARD

Prince Rupert, B.C.

Melville, halibut fishing boat for John Ivarsen, 58'x14'6"x6'4"; 60 H.P. Fairbanks-Morse diesel eng.; launched Mar. 6/28; delivered Mar. 31/28.

Covenant halibut fishing boat for Hans Underdahl, 58'x14'6"x6'4"; keel Dec. 19/27; launched Mar. 6/28; delivered Apr. 3/28.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for Unit-

ed States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Ten covered barges for Carnegie Steel Co.; 175'x26'x11, 2 delivered.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7".

Six barges for Union Barge Line; 132 x 35 x 10 ft.

Ten covered barges for Carnegie Steel Co.; 175'x26x11 ft.

Forty-one barges for Mississippi River Commission; 120x30x7 ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP.,

Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Salt Lake City, light cruiser for United States Navy, 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 15/30 est.

Hull 374, houseboat, owners not named; deliver May 28/28 est.

Hulls 376-377, two carfloats, owners not named; keels May /28 est.; deliver Aug. /28 est.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent, C. H. Hirschinger.

Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs., 2 Scotch boilers, 15'4 1/2"x116"x180 lbs. pressure; keel Aug. 29/27; launched Dec. 3/27; deliver Apr. 2/28 est.

Not named, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 feet beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler; keel Dec. 12/27; launch June 1/28 est.; deliver Aug. 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,

Quincy, Mass.

No. 45, electric cutter for U. S. Coast Guard Service; 250x42x15 ft.; Westinghouse, for Detroit & Windsor Ferry Co.; 156 horse turbines and motors; 3000 S.H.P.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, diesel-electric freighter for Middex Transportation Co., New Brunswick, N.J.; 131 x 31 x 11 ft.; Winton-General Electric machinery; electric auxiliaries; 12 mi. speed.

Not named, steel passenger and freight steamer for the New England Steamship Company, Newport, R.I.; 202 L.B.P.; 36 molded beam; 14'6" molded draft; 1082 gross tons; 4 cyl. TE eng.; B. & W. boilers, coal burning.

Not named, hull 1418, steel passenger and freight steamer for the Pennsylvania Railroad Co., Wm Philadelphia; 300 ft. length; TE engs.

CHARLESTON DRYDOCK & MACHINERY CO.

Charleston, S. C.

Mud scow for Dominican Government; 112x33x12 ft.; 600 yds. cap.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Hull 80, pontoon lock gate lifter for Dept. of Railways and Canals of Canada; 30x30 ft.

Hull 81, motor scow for Brown Corporation, Quebec, 50'x12'x4'.

Hull 82, hopper barge for Dept. of Railways and Canals of Canada; 180 L.B.P. 32 beam; 13 loaded draft; 8 mi. loaded speed; 800 D.W.T.; 700 H.P. TE engs.; 2 Scotch boilers, 12'6" diam.; keel Mar. 21/28.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2895, day cruiser, 50 ft. for stock; 180 H.P. Speedway engs.

Hull 2896, cruiser for Paul H. Demming; 2-155 H.P. Speedway engs.

Hull 2897, cruiser for New York Clubman, 95 ft.; 2-300 H.P. Speedway engs.

Hull 2898, cruiser for J. L. Parsons, 82 ft.; 2-300 H.P. Speedway engs.

Hull 2900, cruiser for R. L. Skofield, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2901, tender for J. H. Seaman, 19'6"; 1-25 H.P. Speedway eng.

Hull 2903, cruiser for New York yachtsman, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2905, commuter boat for Harrison Williams; 56 ft. length; 2-650 H.P. Wright Tophoon engs.

Hulls 2906-11 inc. 6 play boats for stock.

Hull 2912, 68-ft. cruiser for Richard Hellman; 2-170 H.P. Speedway engs.

Hull 2913, 50-foot cruiser for T. C. Henry; 170 H.P. Speedway eng.

Hull 2917, 57-ft. cruiser for S. Rothchild; 2-170 H.P. Speedway engs.

Hull 2919, 57-ft. cruiser for Wm. Ryle; 2-170 H.P. Speedway eng.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Grathia II, hull 125, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27; launch and deliver Apr. 1/28 est.

Luanco, hull 123, steel yacht, owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 13 loaded speed; 110 D.W.T.; 120 I.H.P. diesel eng.; keel July 11/27; launch Apr. 15/28 est.; deliver June 1/28 est.

Memory III, hull 126, steel yacht for A. E. Fikkin, New York; 14'18" L.B.P.; 23'2" beam; 8' draft; 15 mi. speed; 350 D.W.T.; 900 I.H.P. diesel engs.; keel Nov. 15/27; launch May 15/28 est.; deliver July 1/28 est.

Sea Sails III, hull 127, wood yacht for Murray W. Sales, Detroit; 89 L.B.P.; 16' 9" beam; 5' loaded draft; 13 mi. speed; 75 D.W.T.; 160 I.H.P. diesel eng.; keel Jan. 12/28, launch May 1/28 est.; deliver May 15/28 est.

Elto, hull 128, wood yacht for T. A. Yawkey, New York; 56'x11'x3'; 26 mi. speed; 35 D.W.T.; 400 I.H.P. gas engs.; keel Feb. 15/28 est.; launch June 1/28 est. delivery July 1/28 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'26" x 26'6" x 5' 6".

Hull 656, 1 steam dredge for Ohio River Sand Co., Louisville, Ky.; 15'x44x8 ft.; 480 gr.tons.

Hulls 666-668, 3 steel barges for Ar-

New Albany, Ind.: 145'x32'x5ft. 6in.; steam tandem comp. eng. 14"x28"x7'0" stroke; keel March 1/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6'6".

Three barges for Plant Account, 100x26 x6'6"; launched.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6".

Four hopper barges for West Penn. Sand & Gravel Co., Rochester, Pa.; 100x20x6'6".

One steel barge for P. M. Adema, Pointe à la Hache, La.; 120 x 36 x 6 ft.

NASHVILLE BRIDGE COMPANY,
Nashville, Tenn.

Purchasing Agent, Leo E. Wege.

Hull 136 deck barge for Bedford Nugent Co.; 110'x28'x7'3"; keel Mar. 12/28 est.

Hull 137, same as above; keel Mar. 19/28 est.

Hull 138, deck barge for Granville Stone & Gravel Co.; 130'x32'x8"; keel Feb. 21/28.

launched Mar. 19/28.

Hull 139, same as above; keel Feb. 28/28.

launched Mar. 28/28.

Hull 140, same as above; keel Mar. 5/28.

launched Apr. 4/28 est.

Hull 141, deck barge for Big Rock Stone & Mat. Co.; 100'x26'x6'6".

Hull 142, tug for stock; 44'x9'6"x4'3"; 80 H.P. Worthington diesel.

Hull 143, deck barge for International Cement Co.; 180'x40'x9'6"; keel Mar. 21/28.

Hull 144, same as above; keel Apr. 2/28.

Hull 145, same as above.

Cathrine D., hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 L.H.P. diesel engs.

Hull 147, deck barge for Standard Unit Nav. Co.; 49x16x6 ft.

Hull 148, hopper barge for Standard Unit Nav. Co.; 49x16x6 ft.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.

Hull 150, deck barge for stock; 120x30 x6 ft.

Hulls 151-152, two deck barges for stock; 100x24x5 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May /28 est.; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement; keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53'

beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launched Feb. 25/28; deliver May /28 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launch Sept. /28 est.

W. J. Harahan, hull 327, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14'6" depth; one screw; T.E. eng.; Scotch boiler; coal burning; keel Jan. 16/28; launched Mar. 31/28.

Not named, hull 328, steel yacht for Geo. T. Baker, Jr.; 1200 gross tons.

THE PUSEY & JONES CORP.,
Wilmington, Del.

Purchasing Agent: James Bradford.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18½ mi. speed; 1784 gross tons 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27; launched Feb. 6/28; deliver July 1/28 est.

Colleen, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139'9" L.W.L.; 22 beam; 7'6" loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; keel Oct. 15/27; launched Mar. 10/28; deliver May 1/28 est.

THE SPEAR ENGINEERS, INC.,
Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10½ mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel June /27; deliver June /28 est.

Not named, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450 I.H.P. engs.; keel Feb. 18/28.

STATEN ISLAND SHIPBUILDING CO.,
Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers.

SUN SHIPBUILDING COMPANY
Chester, Penn.

Purchasing Agent: H. W. Scott.

Mary Ellen O'Neil, hull 107, tanker for California Petroleum Co.; 510'x70'x40'; 17,000 D.W.T.; 4500 S.H.P. at 82 R.P.M., 8-

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Trade, Traffic, and Shipping

The Trade Promise of the New World

By Walter Parker*

Economist, Fenner & Beane, New York-New Orleans

I AM speaking to the generator of commerce in the United States who desires assurance that his enterprises will profit not only from his own skill and the efficiency of his own organizations, but from a favorable opportunity and from conditions that will promote, not retard, his success.

In the very recent past, the world status of the United States has undergone a far-reaching change. We no longer borrow foreign money. We now have surplus billions to lend and to invest abroad. That gives us the status of world banker. Our mills are now capable of producing an enormous surplus of the finished articles of commerce required by the remainder of the world. More and more we will need the raw materials of other countries. More and more we will need favorable markets in other countries for our manufactures. Our tariff schedules show that we do not desire the importation of foreign manufactures which we can produce at home, even though our price level be higher. Our immigration laws indicate that we desire a check on population increase before, not after, the depletion of our own natural resources, and that we are beginning to get ready for population stabilization. Stabilization will probably come somewhere between two hundred and two hundred and fifty million people. Our scale of living will hardly permit more people than a quarter of a billion within the United States.

Henceforth, therefore, the tendency within the United States will be toward efficiency, personal economy, stabilization of market outlets, improvement in foreign relations, and away from heedless waste of natural resources, neglect of basic economies—in fact, away from the joy ride phase of our national life.

In the past, none of you would have permitted a leaky steam pipe to waste your substance or a mud hole in the approach to your factory to mire up your trucks days after day. In the future, the successful trader in the United States will not neglect the refinements of foreign trade economy, nor permit his trade organizations nor his government to do so.

Foreign Trade

Foreign trade, in ever-growing volume, is now essential to the larger economic welfare of the United States. From now on we must think in terms of the sea. We must learn to know all the peoples of the world, their needs, their habits of thought, their modes of life, their likes and dislikes. Our mills must produce a surplus of the finished articles of commerce if we would keep our labor and our capital employed. They cannot do this unless there be an ample overseas

outlet. Other countries cannot buy from us unless they can sell their own products.

Our objective, therefore, must cover a comprehensive field. We must help other countries help themselves if we are to find markets for our own surplus, and hold our advantageous position as world banker. Our present day status is new to most of us. Many of us must begin our new education in the very kindergarten of world affairs, and learn even the simples of foreign relations. From that training we must develop a nation-wide world complex. The farmer in the interior, himself far removed from the sea, must learn that his affairs, his economy, the success of his daily enterprises, are intimately bound up with the trade of the sea. The small manufacturer, wholly engaged in supplying domestic needs, must learn that should his stronger competitor at home not develop foreign markets, surplus products that might be sold abroad will be sold at home.

The ramifications of our new status in world affairs are almost without limit. Personal as well as collective economy at home will play a larger and larger part in developing our ability to meet the exacting requirements of the period of super-competition in world trade now ahead of us. Our skill in diplomacy as a nation and, more important, our freedom from prejudice, our willingness to learn, and our desire to make real friends of the varied peoples with whom we must come in contact will, to a very large extent, determine how wide the world gate is to be opened for us.

These things concern the man on the street as well as the foreign trader. A single moving picture unjustly treating other peoples can do more harm in a minute than can be undone by our diplomats in a year. A single bumptious salesman can undo much of the good work done by a Lindbergh.

The National Foreign Trade Council is doing what it can to hasten the development of our sea sense, of our understanding of foreign trade, of our ability to capitalize our new opportunities, and I want to discuss today some of the phases of our new world status that we need to deal with.

New Markets

The Latin Americas—Mexico, Central and South America, and the West Indies—have taken the place of the United States as the world's region of greatest attraction to the immigrant and the homeseeker—to the man who, not content at home, has the moral and physical stamina to clear forests, open mines, and pave the way for the generations to come—in other words, the pioneer. Latin America possesses natural wealth in mine, forest, and field on a scale not comprehensible to many people. The region is capable of supplying the

*Address before the National Foreign Trade Convention, Houston, Texas, April 17, 1924.

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MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1

From New York—Central

MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1
MS. S. S. S.	May 1	May 1	May 1

Ports of call—Mexico: Manzanillo, Champoque, San Jose de Guzman, Acapulco, La Libertad, La Union, Anapala, Carrizo, San Juan de Los Rios, Pinar del Rio, and Cristobal.

Ports of call—Central America: San Jose de Guzman, Acapulco, La Libertad, Carrizo, Bahia, Caguas, and Havana (westward only). Panama and Puerto Colombia (West-bound only) and New York.

—Continued from page 27—

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materials required to feed, clothe, and condition practically all the peoples of the world. Its gates are wide open, just as the gates of the United States once were. It welcomes ambitious people from all the world. It has work and occupation for all who come.

In the process of development it will need the factory products of other lands. And it will need money by the billion, engineers, physicians, mechanics. There are highways and railroads, new towns, schools and bridges to be built. Hydro-electric power in abundance is available in most of the countries. Communication, each part with the other, and all with the remainder of the world, is one of the most pressing needs. More cable, telegraph, and telephone lines will be required. Air mail service between the several countries and to the United States and Europe is more and more becoming an essential.

All of the money Latin America may need for its larger development can be made available in the United States. We have or can have a surplus of engineers, physicians, mechanics, and other technical men.

We now possess the capacity for the production of all the pins, needles, shoes, automobiles, structural steel, plows, tractors, ships, airplanes Latin America can use. And, most important of all, we can consume, in ever-increasing volume, the surplus products that Latin America will have to send out. In all the history of the world there has been no parallel of commercial, financial, and industrial potentiality on the grand scale such as the New World now presents. Latin America is ready for development. The United States is able to foster that development in so large a way as to break all previous records, even the marvellous record made by the United States itself during the past hundred years.

But the people of the United States must plan well if they would avoid the economic difficulties which now confront many of their European trade rivals. A nation without natural resources at home is at a disadvantage abroad. A nation burdened by debt and high taxes is handicapped in every field. A people unable to look beyond the near horizon, incapable of practicing the art of thrift and economy, negligent of its nearby opportunities, can hardly capitalize its larger opportunities elsewhere. We must avoid these things.

Waste That Must Stop

I am told that a cubic mile of silt, the fertile soil washings from forty-one per cent of the United States, annually passes down the Mississippi River and into the Gulf as a waste. That is equivalent to three inches from the top of 13,000,000 acres of land. I am told that in flood periods some three million tons of water rush past Cairo each minute as a destroying agent. That water conserved and used for all beneficial purposes would serve the economic needs of the country, and no longer be an agency of destruction. Hundreds of ships, built with money supplied by United States taxpayers, now ride idly at anchor in our ports. Nobody planned for their use in peace times to follow the war. Had there been a plan many of those idle ships might now be serving the development purposes of Latin America and the permanent economic welfare of the United States.

As a war measure the Muscle Shoals power plant was built. Because there was no plan for its peace-time use, the government's monster investment there has not for the past ten years served the larger economic purposes of the people who paid the bill. Because of personal economic indifference the United States wastes, by way of the garbage can, enough food to feed

an important nation. I am told that the most accessible sixty per cent of our coal supply is mined, and that the remaining forty per cent is left behind and lost to human use.

Because of our great wealth we do not protest effectively against public and private negligence and waste. Negligence and waste at home count against our cost levels when we attempt to compete in foreign markets and will count against us in ever-increasing ratio until we stop these leaks. Our wise course would be not only to stop the great leaks, but to turn our attention to the betterment of the economic environment from which we draw our substance, and in that way safeguard our high earning power and at the same time lower our basic costs. It is estimated that a billion dollars of buying power was destroyed by the Mississippi Valley floods in 1927. Safety from floods for the Lower Valley and the use for all beneficial purposes in place of waste in destructive floods of surplus waters will not only stop the loss of buying power through floods but will create new buying power on the grand scale throughout the entire watershed. Power wheels, water for irrigation and all-the-year navigation, checked soil erosion will lower our basic costs without lowering wages. That is the sort of thing I have in mind when I talk of bettering the economic environment.

England and Germany train their young men for foreign trade, and send them to live in the countries whose trade is desired to learn the habits, the needs, the mental reactions, and the trade potentiality of the people. No longer can we hope to rely upon high power salesmen who use only their own language and who know nothing whatever of the people abroad to whom they would sell. We need schools, and many of them, for our consular candidates, for our salesmen, for our sales managers, and for our proprietors.

Helping Our Neighbors

In many ways we need to help our neighbors and natural friends to the southward—help them establish lines of communication, highways, quick mail service, closer contacts. And we need not be selfish in the matter at all. The development of Latin America may yet develop such speed as to tax even the great ability of the United States to serve. An annual in and out trade of ten billions between the Gulf ports of the United States alone and Latin America is not an unattainable goal.

It is clear that the development of our foreign trade involves far more than the mere simples of international relations. We must look to our own economy, and because of our new world status and our great power we must help in an abnormal way in the restoration of a favorable economic status of the old and new world nations. Few people realize that the economic chaos through which the remainder of the world has been passing is, in part at least, due to an overage of foreign trade done by the United States—over-selling abroad during and immediately following the war when there was no counter balancing trade drift. Our protective tariff prevents readjustment through over-selling to us, but, as Mr. Farrell, at a previous meeting of the National Foreign Trade Convention, has wisely pointed out, international balances are now adjusted by world trade, not by the trade between any two countries.

It follows then that the more assistance we give to other countries in the opening up of markets for their own surplus products, the better the markets abroad will be for our own products. It seems to me that the National Foreign Trade Council not only has an im-

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portant factor in our foreign trade policy and for our United States economy. Foreign trade has to promote the economic development of our country, and our government is free and God bless her, determined to remove overseas restrictions that be a burden to the United States in export and import business.

How can we help our sister countries of the United States and the United States achieve the goal of our foreign trade policy?

Instead of looking for trouble, let us look for the good. Let us look for the good and the good of the United States. Let us look for the good of the United States and the good of the United States.

The United States through Mexico, Central and South America. The United States can well afford to help the smaller countries to the southward complete this project.

Prompt development of port-to-port transportation in Latin America and the United States. The United States can well afford to subsidize such steamship lines.

Air mail service between the trade centers in Latin America, each with the other and all with the United States and the mail service between the United States and Europe.

Schools and still more schools in the United States for foreign service, particularly Latin American service.

In other words, to develop our foreign trade opportunities to the full, we must check waste at home, improve our own economic environment, and help the nations abroad develop their own buying power by gain-

ing larger outlets for the products that come to us.

There are some things in the history of the United States that are important for our national economic future. There are some things in the history of the United States that we can well afford the cost to money and time required to bring them to light.

A Blazed Trail

THE first time that the American Chamber of Commerce in the United States was organized, it was pointed out by the Secretary of the Chamber of Commerce of the United States.

The American foreign trader has available a wide network of agencies to assist him in carrying on his business with overseas clients such as is available in no other country.

In its "Foreign Commerce Handbook, 1928-1929," just issued, the Department lists, under 93 alphabetically arranged topical headings, hundreds of sources in the United States from which information and service in export and import trade may be obtained. Under Government agencies is singled out particularly the Government Bureau of Foreign and Domestic Commerce; business associations include the Philadelphia Commercial Museum, the National Association of Manufacturers, the American Manufacturers' Export Association, the National Foreign Trade Council, the American Exporters' and Importers' Association, and the National Council of American Importers and Traders.

Freights, Charters, Sales

April 16, 1928.

THE following steamers are reported fixed with grain to the U. K.-Continent: A British steamer, Vancouver to Antwerp or Rotterdam, 28/-, Hamburg 28/6, any two ports 9d. extra, Mar.; Italian str., Vancouver to U. K.-Continent, 31/6, Mar.; British str. Oakworth, Vancouver to Antwerp, 27/-, L. Dreyfus & Co.; Japanese str. China Maru, Vancouver to U. K.-Continent, 27/6, Mar.; British str. Castlemoor, same, 27/3, May, Furness, Withy & Co.; British str. Dailwen, same, rate not named, Mar.; British str. Innerton, same, 27/-, Apl., L. Dreyfus & Co.; British str. Ovington Court, British Columbia to U. K.-Cont., 27/6, Antwerp or Rotterdam, 6d. less, Apl., Heatley & Co.; British str. Simonburn, Vancouver to Antwerp or Rotterdam, 27/-, Apl.; British str. Taransay, Vancouver to U. K.-Cont., 28/-, full options Antwerp or Rotterdam 6d. less, grain, Apr./May; British str. Tesspool, Portland to U. K.-Cont., 28/6, May, Heatley & Co.; British str. —pool, Vancouver to Antwerp or Rotterdam, 28/-, Apl., Hamburg 28/6; Japanese str. —Maru, Vancouver to U. K.-Cont., 29/-, if Antwerp/Rotterdam 28/6, option Portland/Puget Sound loading 30/-, Apl.; Japanese str. —Maru, Vancouver to Mediterranean ports 30/-, Apl.; British str. Grain-ton, Vancouver to Antwerp or Rotterdam, 26/-, option Hamburg 26/6, wheat, Wm. H. Pim Jr. Co., Apl.-May; British m.s. King Malcolm, Vancouver to U. K.-Cont. grain, 26/6; British str. Zurichmoor, Vancouver to U. K.-Cont., Apr., R. W. Greer & Son; a "K" Line str., Vancouver to U. K.-Cont., 26/-, option Antwerp or Rotterdam, 26/-, May; a steamer, Vancouver to Antwerp or Rotterdam, 25/9, option Hamburg 26/3, Wm. H. Pim, Jr. Co., May; Swedish str. Sagoland, Vancouver to U. K.-Cont., 26/6, Antwerp or Rotterdam, 26/-, May; a str., Vancouver to Antwerp or Rotterdam, 25/9, Hamburg 26/3, any two ports, 9d. extra, May; Jap. str. Vancouver to U. K.-Cont., 26/6, Antwerp/Rotterdam, 26/9, 9d. extra if Prince Rupert loading, May; Japanese str. Yaye Maru, Vancouver to Antwerp or Rotterdam, 30/-, Apl.

The British str. Comliebank is reported fixed with lumber from Coos Bay and Columbia River to Australia, Apl. loading, by J. J. Moore & Co.

The following fixtures are reported for lumber to the Orient: Japanese str. Malta Maru, North Pacific to Japan, Apl., Nakata & Co.; Norwegian m.s. Brand, Columbia River to Japan, J. J. Moore & Co.; Jap. str. Bankoku Maru, Puget Sound to Japan, Apl., H. R. MacMillan Export Co.; Japanese str. Toyokawa Maru, Columbia River to Yokohama and Nagoya, \$9.10, Apl.-May, J. J. Moore & Co.

The following steamers are reported fixed with lumber to the Atlantic: American m.s. Frank Lynch, North Pacific to Porto Rico, Apl., Hammond Lumber Co.; American str. New York, British Columbia to North of Hatteras, \$13.50, May; British str. Hartbridge, British Columbia to U. S. Atlantic port, \$12.75; Danish m.s. Stensby, British Columbia to U. S. North of Hatteras, \$13.25, May; Danish m.s. Nordhval, same, June.

The following steamers are reported fixed from the North Pacific to U. K.-Continent: British str. Atlantic City, to 1 port U. K., ties, 57/6, May, H. R. MacMillan Export Co.; British str. Orient City, lumber, 1 port U. K., 63/9, two ports 65/-, May/June, Douglas Fir E. & E. Co.; British str. Eastmoor, B. C. to U. K.-Cont., wheat and lumber, May; British str. Cragness, North Pacific to U. K.-Cont., lumber and merchandise, June, W. L. Comyn & Co.

The British m.s. King Lud (not King John) is reported fixed from Puget Sound and British Columbia to South Africa, lumber and merchandise, J. J. Moore & Co., Mar.-Apl.

The following tanker fixtures are reported: American str. George W. Barnes, California to not east of New York, 63c, May, clean; Norwegian m.s. Markland, California to U. K.-Cont., 28/-, May; British motorship Sylvafield, California to U. K.-Cont., 28/6, May, clean; American str. M. F. Elliott, California to North of Hatteras, 66 1/2c, middle May, clean.

The British steamer Holmpark is reported fixed from British Columbia and Puget Sound to London with merchandise, Apl. loading, by Canadian American Shipping Co.

The following time charters are reported: Br. str. Glenworth, Pacific trade, 6 months; British m.s. Pacific Commerce, Vancouver to Montreal, deliver Balboa, lumber; a steamer, 1 round trip Pacific, del.

and redel. U. S. North of Hatteras, lumber, 80c, Mar.; British m.s. Ashburton, 9 months, del. and redel. Australia, J. J. Moore & Company; German str. Kersten Miles, del. Japan, redel. St. Lawrence via North Pacific, 95c, Apr./May, Canadian Trading Co.; British m.s. Cynthiana, 1 trip, delivery Colon, redelivery U. K. via North Pacific, May, W. L. Comyn & Co.; British str. Invella, B. C. to North of Hatteras, Canadian Transport Co.; British str. Ellaston, continuation time charter, 3 months, 90c, H. R. MacMillan Export Co.; British str. Golden Sea, del. Japan, redelivery North of Hatteras via North Pacific, \$1.15, May/June; British str. Silurian, delivery Colon, redelivery U. K.-Continent, via North Pacific, \$1.20.

The following sales are reported: American str. Santa Ana, Santa Ana S.S. Co. to Washington Alaska Trans. Co., Seattle; American str. Nebesna, Alaska S. S. Co. to H. Lueddemann, Portland; three steamers, Submarine Boat Corporation (Transmarine Lines), New York, to Matson Navigation Co., delivery San Francisco.

PAGE BROTHERS, Brokers.

ON THE LUXURY SIDE

FIVE of the twelve items for which new high import records were established during the year 1927, the list of which is published in the analysis, Our World Trade, made by the Department of Foreign Commerce of the Chamber of Commerce of the United States, come under the general head of foodstuffs. They are:

Bananas, 61,009,000 bunches, \$34,269,000.

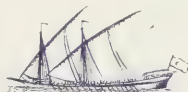
Cheese, 79,796,000 pounds, \$24,500,000.

Spices, 111,202,000 pounds, \$20,088,000.

Canned vegetables, 105,796,000 pounds, \$6,267,000.

Dessicated coconut meat, 60,265,000 pounds, \$5,228,000.

In value, fur imports attained a new record, reaching \$126,982,000. New quantity records were established by silk, 74,005,000 pounds, and rubber, including latex, 954,817,000 pounds.



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PLEASE MENTION PACIFIC MARINE REVIEW



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

The recent visit to San Francisco of C. J. Pannill, vice-president and general manager of the Radiomarine Corporation of America, emphasizes the constructive policy of that corporation in its efforts to bring wireless communication with and between ships at sea to the highest possible point of efficiency.

Mr. Pannill was formerly vice-president and general manager of the Independent Wireless Company and on the merging of the marine department of the R.C.A. to form the Radiomarine Corporation he was retained in the same capacity by the new corporation.

Prominently identified with wireless at sea for more than two decades, Mr. Pannill is now carrying on with great zest in the new and enlarged opportunities opened up by this merger of interests.

The program of betterments has now progressed to the point where all coastal stations of the Radiomarine Corporation are equipped with vacuum tube apparatus of exceptionally long range capacity, and all ships operating on a rental basis are similarly equipped. The fleet of approximately 1600 vessels that own the sets with which they operate are being converted as rapidly as the steamship companies can be induced to effect the change.

The modern vacuum tube transmitter emits sharply timed clean-cut signals. This feature eliminates the objectionable interference so often experienced with the broad notes emitted by other apparatus, and is especially valuable in time of emergency when failure to get a signal across promptly and accurately may mean great loss of life and property.

Of special interest to Pacific



C. J. Pannill, vice-president and general manager, Radiomarine Corporation of America, and G. Harold Porter, manager of the Pacific division of the R.C.A., congratulating Joseph E. Croney, marine wireless operator on winning the Veteran Wireless Operators' medal awarded for meritorious service.

Coast mariners is the new Radiomarine coastal station now under construction at Torrance, California, and to be put in operation during this month. This station is to supersede the Wilmington station. It will have two steel towers 200 feet high, and will be equipped to transmit commercial communication and marine signals to all parts of the Pacific.

Tremendous strides are being made by the Radiomarine Corporation in the installation of their new type radio direction finder as installed on the steamship *Leviathan* on the Atlantic and the steamship *Malolo* on the Pacific, the two outstanding passenger liners of their respective oceans. One hundred sets of this high class navigating instrument were recently purchased by the United States Steel interests for installation on their Great Lakes fleet. Eighteen sets have been installed by the Texas Corporation and fourteen are in pro-

cess of installation on another Atlantic Coast fleet.

G. Harold Porter, manager of the Pacific Division of the Radiomarine Corporation, is very optimistic over Pacific Coast prospects and achievements, and by his fair and honorable dealings and friendly spirit has won for himself and his firm the cordial appreciation of shipowners and operators.

During the visit of Mr. Pannill, he had the pleasure of assisting Mr. Porter in the very delightful ceremony pictured herewith.

The American Association of Veteran Wireless Operators instituted some time back a gold medal award to be presented at their annual meeting to the marine wireless operator who, during the past calendar year, had acquitted himself most meritoriously in an emergency. This medal was made in duplicate, one for Atlantic Ocean service, one for Pacific. Mr. Porter was asked to submit his recommendations for the Pacific award and submitted the story of operator Joseph E. Croney, of the steamship *Indiana Harbor*, which was wrecked on the rocks south of Point Gorda, 185 miles north of San Francisco, on the night of May 18, 1927. This steamer hung on the rocks, gradually going to pieces in a heavy sea, for 73 hours before the Coast Guard could get its shore apparatus to the spot and rig a breeches buoy to take off the crew. During all the time Joseph E. Croney, without any spectacular action, nursed his apparatus, kept it up to full efficiency, kept his owners and passing vessels fully informed of conditions, helped greatly in keeping up the morale of the crew, used pocket flash light at night and flag during the day to communicate by Morse code with Coast Guard men ashore, and in every way showed a rare combination of cool-headed common sense and good nature.

While steam was up and the ship's generating set available for current, Croney kept his batteries fully charged, and when the boiler room bulkhead threatened collapse and steam had to be blown off and

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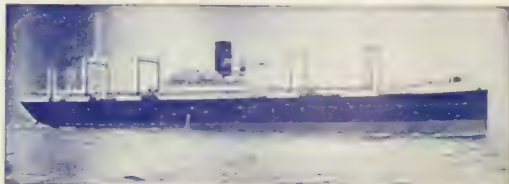
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fires banked to prevent explosion, his batteries were up 100 per cent. Having given his position to several ships and being assured that they were relaying his S.O.S., Croney husbanded his set and used it only for definite work with the nearest vessels and with his owners. He and the captain were the last to leave the wreck, and his last act was to send out a general message of the rescue successfully accomplished and to wireless the owners' tug in the offing to stand by for signals from the shore.

The actual award of the medal was made at the annual meeting of the Wireless Operators at New York. Joseph E. Croney, who is now somewhere on the Pacific Ocean, was apprised of the award on his last visit to San Francisco, and through G. Harold Porter of the Radiomarine Corporation will be presented with the medal on his next visit to this port.

Joseph "Joe" Barker, one of the most popular engineers that ever sailed the Pacific, and who for twenty-five years has been port engineer for the Matson Navigation Company, is going to resign on May 1.

Mr. Barker, and few persons ever call him by this prefix, joined the Matson Navigation Company in 1902. His first berth was on the tanker Rosecrans, when the late Captain William Matson was engaged in the oil transportation business.

Three months ago, when "Joe" Barker was ready to sail on a pleasure tour to the Hawaiian Islands, South Seas, and Antipodes aboard the liner Ventura, he was escorted from the Matson Building and along the waterfront to pier 32 by three hundred friends in gala attire, headed by a brass band. This ovation was the largest ever accorded an engineer and, indeed, the first of its kind on the Pacific Coast.

There are few officials in the maritime world that are better liked or more popular than "Joe," and news of his retirement was received with regret from Meiggs wharf to Hunter's Point and on the Pacific Ocean operated vessels, large and small, of all companies. Mr. Barker hinted that he plans to retire to his ranch in Napa, but his friends state that "Joe" will never entirely desert the waterfront.

Plans are underway for a farewell banquet in "Joe's" honor by his legion of friends in the maritime world.



Noboru Ohtani, managing director, Nippon Yusen Kaisha.

Charles J. Kuhn has been definitely appointed chief engineer aboard the Panama Mail liner Colombia by Port Engineer Merle Johnson. With jovial William Bowers as first assistant engineer, everything below decks on the Colombia is running "ship-shape."

Noboru Ohtani, managing director of the Nippon Yusen Kaisha, one of Japan's foremost progressive shipping executives, upon his arrival in San Francisco announced that airships as adjuncts to transpacific liners will be commonplace a few years hence.

On this, his first visit to America since the N. Y. K. took over the Toyo Kisen Kaisha. Mr. Ohtani stated that his visit was for the purpose of surveying shipping conditions in this country. The N. Y. K. Line is carrying on a \$40,000,000 building and renewal program, which, according to shipping men,



John Phesser, recently appointed port steward of the Admiral Line, swapping yarns with Mayor Walker of New York.

is the most extensive building program of any individual shipping company in the world. He said that Japan has too much tonnage and that what his country needs is not more tonnage but new ships. "It is time," he said, "to replace our ships, and this is our aim, as indicated by the N. Y. K.'s program of building of three diesel motor liners for the California-Orient service." These vessels will be able to make 19½ knots and maintain a sea speed of 17 knots in any weather.

Ohtani and his party toured the Pacific Coast and then proceeded to the Eastern seaboard.

James King Steele, editor and publisher of "Japan" and publicity and advertising manager for the Nippon Yusen Kaisha, will leave in September for his annual inspection tour of the Far East.

With the retirement of William Harry, veteran commissary executive of the Matson Navigation Company, Perry Otteson, port steward of the Admiral Line, was appointed to this position.

John Presser, who has served for many years on transpacific vessels and coastwise liners, was selected by H. F. Alexander to direct the Admiral Line's steward department at San Francisco.

Arthur Cahill, popular president of Sudden & Christenson, San Francisco, with his family, is expected to return early this month from a trip to the Hawaiian Islands. "Just pleasure," declared Mr. Cahill before sailing.

Henry Wolters, assistant port engineer of the Matson Navigation Company, is expected home within two weeks from Honolulu, where he has been for the last month making an inspection of the company's terminals.

The death at sea of Captain John Hill, veteran shipmaster, was announced on April 13, via radio. Captain Hill passed away aboard the N.Y.K. liner Siberia Maru after an attack of apoplexy, according to advices from the Japanese liner. Hill was en route to make a last tour of the Orient when stricken. Captain Hill was for many years in the service of the old Pacific Mail. He was chief officer of the old liner Asia when that vessel ran aground and was wrecked off Finger Rock, China, in 1911. Timothy

Healey, San Francisco attorney, at that time a newspaper reporter, was aboard the craft when the fatal accident occurred. Hill's death closely follows that the M. H. Hunt, his old friend, general passenger agent of the United States Lines for many years. A widow, residing at 448 Guerrero Street, San Francisco, survives Captain Hill.

A surprise in shipping circles was the sudden resignation of Theodore Henry Jacobs as Pacific Coast passenger agent for the Hamburg-American Line, with headquarters in San Francisco. Jacobs has been identified with the Hamburg-American Line since the organization resumed their European-Pacific service following the war. Jacobs, prior to joining the Hamburg-American interests, was identified in the San Francisco offices of the United States Lines.

E. A. Winkler, formerly of New York, took over Mr. Jacob's duties.

Captain John T. Diggs is now comfortably ensconced in his new position as a member of the San Francisco Bar Pilots' Association. The freighter Dakotan was the first vessel piloted in through the Golden Gate by the former shipmaster of the Matson Navigation Company. Captain Diggs is filling the post left vacant through the death of Captain Healy. Diggs was formerly on the bridge of the liner Maui.

Andrew A. Moran, formerly freight traffic manager of the Dollar S.S. Line, has joined the freight traffic forces of Sudden & Christenson at San Francisco. Moran, it is understood will handle the San Francisco freight business for the States Steamship Line of Portland, which recently purchased the Oregon-Oriental Line fleet from the government. Sudden & Christenson are San Francisco agents for the new line.

As general passenger agent of the United States Lines, with supervision over the Pacific Coast territory, H. E. Perkins, whose appointment was recently announced, has assumed his new duties. Perkins is filling the vacancy resulting from the death of Moses Hunt, and will have his headquarters in San Francisco. He is well known in Pacific shipping circles, where he served with various steamship lines and railroad companies, including the old Pacific Mail.



Leo J. Gallagher, purser of the steamship California, equipped for fancy dress stuff.

Leo J. Gallagher is back on the intercoastal run as purser of the steamship California. Leo was purser of the Finland in 1923 when she made her first trip on the Panama Canal run. He has had long experience at sea and comes from an old line of seafaring men. His father was with the American Line thirty-six years, and an uncle was thirty years with the British lines of the International Mercantile Marine Company, serving for some time as chief steward on the Majestic. Gallagher joined the American merchant marine during the war, coming to that service from the Associated Oil Company.

The Oceanic and Oriental Navigation Company, owned jointly by the Matson Navigation Company and the American-Hawaiian Steamship Company, has renamed the shipping board freighters which they took over recently as follows:

Former name	New name
Bearport	Golden Mountain
West Chopaka	Golden Dragon
West Faralon	Golden Hind
West Prospect	Golden Sun
Crisfield	Golden Horn
Montague	Golden Tide
Elkridge	Golden Star
Pawlet	Golden Wall
Cross Keys	Golden Peak

The vessels named above will be operated in the China trade of the company.

The vessels to be operated in the Australia-New Zealand trade by the Matson interests, together with their former and new names follow:

Former name	New name
Dewey	Golden State
West Carmona	Golden Fleece
West Cajoot	Golden Bear
West Calera	Golden Harvest
West Conob	Golden Eagle
West Elcajon	Golden Kauri
West Nivaria	Golden Coast
West Togus	Golden Forest

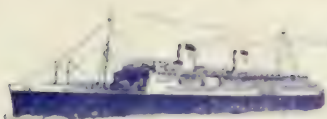
Four vessels of the Oceanic & Oriental fleet are as yet unassigned and are:

Former name	New name
West Ivan	Golden West
West Sequana	Golden Cloud
West Islip	Golden Rod
West Henshaw	Golden Cross

The changes in names of the former Oregon-Oriental fleet as purchased by the newly formed com-



The deck officers of the new Panama Pacific electric liner California. All of these men carry master mariner's certificates to operate any size vessel on any ocean. Left to right, they are: John Iverson, chief officer; John Mockrish, first officer; Carl Hizenberger, second officer; Charles Travers, junior second officer; John Fagan, third officer; Harry Connors, junior third officer.



HAWAII

*by the swiftest, shortest route
—the magnificent MALOLO*

Malolo, the new liner to the Hawaiian Islands, is the swiftest, greatest of the Matson line. She is a fine, fast, and comfortable ship, with a fine crew, and a fine service. She is the only ship of her kind in the Pacific.

Malolo is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific.

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AUSTRALIA

and the South Seas

Malolo is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific.

Features of the Malolo

Malolo is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific. She is the only ship of her kind in the Pacific.



Thousands of Soundings

NOT one or two, but thousands of soundings are at your command—with the FATHOMETER.

Before your hand can leave the operating button, a continuous sounding operation has begun. A beam of light gives a constant picture of the changes in depth instant by instant. The sounding operation will continue just as long as you wish—a minute, an hour, or a day.

With the FATHOMETER, you will have a new sense of security because you will KNOW the depth under your ship at any instant.

Operating the FATHOMETER is just as easy as telling time with a clock. After the button is once pressed, a glance is all that is necessary.

The FATHOMETER is now in use on yachts, cable ships, submarines, Coast Survey, and Coast Guard vessels, battleships, and merchant ships. American, English, German, Japanese, and Peruvian ships are now equipped with the device.

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Submarine Signal Corporation

160 State Street

Boston, Massachusetts, U.S.A.

Matson line
Hawaii · South Seas
Australia

225 MARKET STREET, SAN FRANCISCO

pany known as the States Navigation Company of Portland, Oregon, are as follows:

Former name	New name
Oakridge	Oregon
West Hixton	California
West Cayote	Washington
Wawalon	Wisconsin
West Holbrook	Michigan
West Cadron	Iowa
West Kader	New York
Las Vegas	Illinois
West Niger	Nevada
West O'Rawa	Kentucky
West Momentum	Pennsylvania

Seven other vessels of the old Shipping Board fleet operated out of Seattle will shortly be rechristened by officials of the Tacoma-Oriental Line.

Every deck officer aboard the Panama-Pacific liner California, from the chief officer, John Iverson, down to Harry Connors, junior third officer, is a master mariner with certificates to operate any size vessel on any ocean.

Don F. Walker, intercoastal clerk and accountant agent for the Los Angeles offices of the Pacific Steamship Company, has resigned and is now associated with the Nelson Steamship Company as contracting freight agent. His position with the Pacific Steamship Company has been filled by K. E. Drebert from the dock office. Walker was with the Pacific Steamship Company since 1922.

Special trains carried representatives of virtually all steamship lines on the Pacific Coast to attend the Fifteenth National Foreign Trade convention in Houston which was in session the last week of April. Up to the time of going to press reports were that determined efforts were being made by freight traffic managers and officials of steamship lines in all Pacific Coast ports to bring the 1930 convention to Los Angeles, Portland, San Francisco, Seattle, or Vancouver.

J. A. H. "Jack" Kerr, vice-president of the Security Trust & Savings Bank, has been reappointed chairman of the Harbor and Foreign Commerce Committee of the Los Angeles Chamber of Commerce. There are seventeen steamship men on the committee.

The United States Hydrographic Office at San Francisco reports that the port of Salina Cruz, Mexico, was closed last month to navigation



Guy E. Buck, general freight agent of the Panama Mail Steamship Company and a delegate to the National Foreign Trade Convention at Houston during the last week of April.

gation due to shoaling having made the entrance to the port impossible. This port in the past was one of the most up-to-date in Mexico.

Before the Panama Canal was built, American-Hawaiian freighters unloaded their Pacific Coast freight there, as it was the terminus of the Tehuantepec Railway, the cargo being hauled to Puerto, Mexico, where it was loaded on steamers for Atlantic Coast ports of America.

Pacific Coast and Europe will be the scene of a further investigation of thefts and pilferage of cargoes following the results of a two year probe on which a report has been presented by a committee of mari-



Captain F. E. Anderson, master of the Dollar liner President Wilson.

time interests in the port of New York. Plans have been discussed for the formation of a bureau to be directed by the committee, in which theft complaints will be investigated. Hundreds of thousands of dollars are lost annually by shippers and steamship lines and higher insurance rates are the result. International cooperation is necessary in a work of this kind, if losses are to be checked. A. P. Hammond, general manager of the California and Eastern Steamship Company, Los Angeles, explained that shippers and shipowners realized that there were longshoremen, crews, and other employees who robbed warehouses and looted the holds of ships but that the New York report had not yet proved that this could be stopped. He suggested that a definite plan be drawn to combat pilferage, including the division of cost for the carrying on of this work. The investigation on cooperative lines is expected to assume world-wide proportions with the announcement that a similar investigation is under way in Australia.

The passing of Mose H. Hunt, general agent at San Francisco for the United States Lines, came as a distinct shock to thousands of friends in all parts of the world. Mr. Hunt first entered the steamship business with the old Pacific Mail Steamship Company as a shipping clerk in 1901. He served this company as general agent in Kobe, Manila, Singapore, and the Panama Canal Zone. He then came to San Francisco, sailing as purser on vessels of the company. He left the Pacific Mail to become purser of the liner Leviathan, where he made an enviable record. Later he was assigned to the Los Angeles offices of the United States Lines, and about a year ago was named general agent for the government merchant marine at San Francisco. He is survived by his widow.

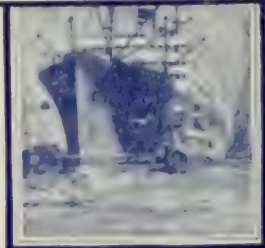
Paul N. Carter is now connected with the Matson Navigation Company at Los Angeles, directing his activities towards freight solicitation for the Oceanic and Oriental Navigation Company, covering the Australian and New Zealand trade. Carter was formerly with the Dollar Line and the Los Angeles Steamship Company.

Port Newark, New Jersey, is now a regular westbound port of call for vessels of the Luckenbach Line. A sailing from the New Jersey port

FREIGHT SERVICES

which girdle
THE GLOBE

SAILING under the American flag, freight services operated for the United States Shipping Board, comprising 23 lines and 278 ships, leaving from Atlantic Coast and Gulf Ports for ports of the United Kingdom, Irish Free State, Continental Europe, South America, the Orient, Dutch East Indies, Australasia, India and Africa, have aided materially in opening up new markets for merchandise and giving added impetus to the foreign trade of hundreds of progressive American shippers.



Passenger Service. Included in the services are the quality passenger vessels of the United States Lines sailing from New York to Europe and Australia, the ship the American Mail and Line operating weekly between New York and Los Angeles offering passenger accommodations at remarkably reasonable rates.

PACIFIC COAST LINE

San Francisco, Los Angeles, Seattle, Tacoma, Portland, Vancouver, British Columbia, Alaska, Yukon, Northwest Territory, Canada, Europe, Australia, India, Africa, Asia, Oceania, etc.

ATLANTIC COAST LINE

New York, Boston, Philadelphia, Baltimore, Washington, Norfolk, Virginia, North Carolina, South Carolina, Georgia, Florida, Cuba, Haiti, Santo Domingo, etc.

AMERICAN LINE

New York, London, Liverpool, Manchester, Glasgow, Belfast, Dublin, Cork, Bristol, Southampton, Antwerp, Rotterdam, Amsterdam, Hamburg, Bremen, Cologne, Frankfurt, Munich, Vienna, Prague, Budapest, Warsaw, St. Petersburg, Moscow, etc.

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GULF COAST LINE

New Orleans, Mobile, Savannah, Charleston, Jacksonville, Tampa, St. Petersburg, Pensacola, Panama, Colon, San Francisco, Los Angeles, Seattle, Tacoma, Portland, Vancouver, British Columbia, Alaska, Yukon, Northwest Territory, Canada, Europe, Australia, India, Africa, Asia, Oceania, etc.

ATLANTIC COAST LINE

New York, Boston, Philadelphia, Baltimore, Washington, Norfolk, Virginia, North Carolina, South Carolina, Georgia, Florida, Cuba, Haiti, Santo Domingo, etc.

AMERICAN LINE

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For complete information as to shipping services, contact the United States Shipping Board, Washington, D. C.

UNITED STATES SHIPPING BOARD

Merchant Fleet Corporation
WASHINGTON, D. C.



*All rates are subject to change without notice.

every Monday makes possible the landing of cargo in Los Angeles harbor in 19 days, 12 hours. Entrance of the Luckenbach Line into Port Newark marks the first "A" Line member of the United States Intercoastal Conference to enter the New Jersey port. The Transmarine Corporation, a "B" Line member of the Conference, makes Port Newark its only port of call on the Atlantic Coast.

A popular visitor to the Pacific Coast late last month was W. A. McCarthy, general freight agent of the American-Hawaiian Steamship Company. Mr. McCarthy makes his headquarters in Rochester, New York. During his two weeks stay on the Pacific Coast he was taken on an extensive tour of water terminals at all ports. F. A. Hooper, Los Angeles agent for the American-Hawaiian, was host to Mr. McCarthy upon his arrival, and while in San Francisco he was entertained by John Cushing and Thomas G. Plant, executives in this city. Mr. McCarthy was impressed by the activities witnessed in all Pacific Coast ports.

The Los Angeles Steamship Company closed 1927 with a net income of \$438,399, which is \$107,189 less than earned for the previous year. Total revenues from water line operations last year amounted to \$4,871,189, a gain of \$633,817 compared with 1926. Expenses incidental to such operations totaled \$4,303,947, an increase of \$712,172. The net revenue from water line operations amounted to \$567,323, or \$78,355 less than that for 1926.

As a result of abuse of the half rate dockage rule for idle vessels, the Board of State Harbor Commissioners at San Francisco announced approval of a new rule which provides that inactive vessels shall begin to pay full dockage rate after they have been idle ten days.

Hawaiian Island travel will boom with the placing in service of the new Inter-Island passenger liner Waialeale, which is now being finished at the Bethlehem shipyards, San Francisco, under supervision of G. K. Nichols, manager of engineering and repairs of the Matson Line. The ship has large side ports and passengers will be able to drive their cars aboard from the dock and park them in the vessel's garage for the run to different island ports.

Sudden & Christensen are San Francisco agents for the new Tacoma and Oriental Steamship Company of Tacoma and the States Steamship Company of Portland, when their vessels, recently purchased from the United States Shipping Board, make San Francisco a port of call. A. A. Moran will be in charge of transpacific services.

Experiments for the utilization of seaplanes in expediting the handling of transatlantic mails, and possibly also for the convenience of passengers desiring to save time, will be commenced soon by the French Line, according to an announcement from the Paris head-



Captain William A. Magee, master of the Lasso liner Harvard.

quarters. A special platform, on which it is planned to install a catapult similar to those used in launching planes from vessels of war, has just been erected on the stern of the liner Isle de France, and experiments will be conducted from this ship. The catapult system has been chosen, officials of the line state, because it will be possible to launch planes several hundred miles off shore in nearly any kind of weather. The first experiments probably will be made carrying mail, particularly important financial mail, in which a saving of twenty-four hours may mean the saving of a considerable sum of money. The experiments are expected to be conducted early in the month of May.

As assistant port superintendent of the new Oceanic and Oriental Line, Captain F. C. Swicker, veter-

an shipmaster of the American-Hawaiian Steamship Company, has assumed his new duties. The announcement of the appointment was made recently by Thomas G. Plant, operating manager. Swicker will work under M. J. Kane.

Captain Helge Maland, well known in local shipping circles, is now port pilot at Los Angeles Harbor. Maland is filling the vacancy created through the resignation of Captain T. D. McFarland. Maland's last sea command was the steamer Dorothy Wintermote.

As surveyor for the San Francisco Marine Board of Fire Underwriters, Captain R. W. McNelly, formerly with the firm of Hibbs & McCauley, well-known naval architects, has assumed his new duties.

Freight offerings to and from the Orient are on the upward trend, judging by the activities of the American Mail Line. Following charter of the International Mercantile Marine freighters Montauk and Montana for the new American Mail transpacific service out of Seattle, R. Stanley Dollar made the announcement that he is seeking still more tonnage for the trade.

Ship operators are watching with interest the performance of the Los Angeles Steamship Company liners Yale and Harvard, on which new propellers have been installed that have enabled them to chop an hour off the running time between San Francisco and Los Angeles. Based on this performance, each vessel will effect an estimated saving of \$20,000 a year.

The installation of new propellers on the Harvard and Yale was undertaken after more than a month's concentrated study by William Lambie, naval architect, of Los Angeles, prior to the drafting of the designs. Lambie checked the speed of the engines, the size of the old propellers, the speed of the ship with the old propellers, seeking to work out a combination which would give the liners the maximum speed and minimum fuel consumption.

The two vessels, being triple screw craft, required a total of six propellers of the Lambie design. Each of the wheels weigh 2600 lbs., and is 6 feet 9 inches in diameter. The material is bronze, the Doran Company of Seattle doing the casting.

Foster Marine Economizer



This ship is now in service for the U. S. Shipping Board
under charter.

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IN RED - BLOW FOUR WHISTLES
WHEN CLEAR - BURN BLUE LIGHT OR JACK AT FORECAST

Pacific Marine Review

The National Magazine

of Shipping

JUNE, 1928



A LOHA! WAI ALE ALE ☞ Welcome to your home port at the cross-roads of the world's mightiest ocean ☞ with its glorious traditions ☞ bright promise of a splendid future ☞ proud are we to have a hand in it all ☞ standing by for the relief of ships in need of repair ☞ fitted out with machine shops, foundry, and all necessary gear ☞ an able crew at your service.

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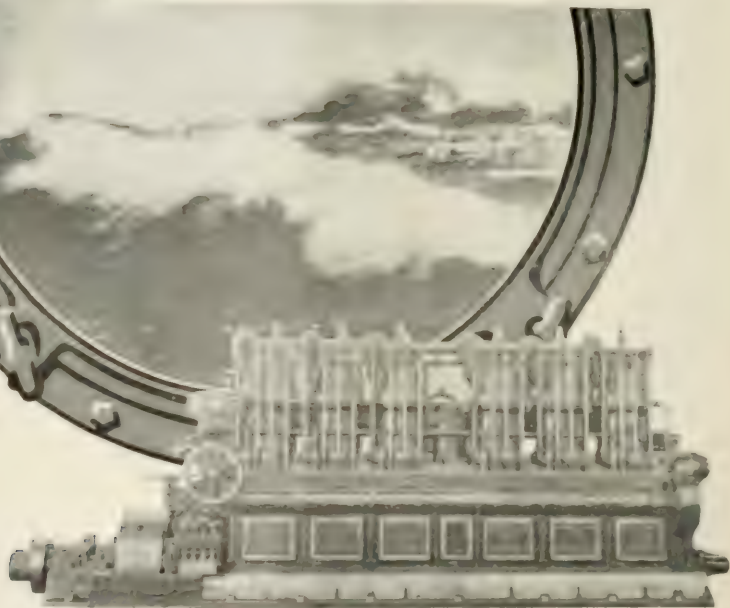


East and West Meet on Shipping Plans

ANTICIPATING favorable action on the Merchant Marine Act of 1928, Jefferson Meyers of Portland, Oregon, and E. C. Plummer of Portland, Maine, United States Shipping Board Commissioners, envision a \$55,000,000 shipbuilding program to meet the foreign trade expansion of the Pacific Coast. Their anticipation of last month has now been realized.



Through a Thousand Storms
WASHINGTON-ESTEP DIESEL ENGINES
have proved Their Worth



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 Open Side Main Frame
 Force Feed Oiling System

Removable Cylinder Liners
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Seattle, U.S.A.

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Pacific Marine Review

The National Magazine of Shipping



Official Organ
Pacific American Steamship
Association

James S. Hines,
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Bernard N. De Roche,
Vice-President and Manager

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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A Short Chapter from the Sea Service of Captain Emory Rice

By W. C. Bunner

PROBABLY the most popular among latter-day commanders of the old Pacific Mail Steamship Company's transpacific service was Captain Emory Rice. Furthermore it may be said that Emory Rice was most thought of by those with whom he was on terms of greatest intimacy. This was verified during 1914 while he was in command of the Mongolia and was stricken with Spanish influenza, which developed into pneumonia, and his two old shipmates, Dr. F. G. Leach and Purser Mose Hunt, stood watch and watch at his bedside until the crisis was passed.

They were inseparable messmates, were those three members of the Pacific Mail's old guard. 'Twas but the other day that the last of this popular trio passed out across the inevitable Bar, in the person of the beloved Mose Hunt, who had risen in his career to the coveted post of Pacific Coast representative of the United States Lines at San Francisco.

In the parlance of sailormen, it could not be said that Captain Emory Rice came aboard via the forward chains, neither did he come over the stern. For he was a product of the warrant officer's line in the United States Navy, where he had reached the top rung of the ladder and might easily have attained a midshipman's commission, as he had passed his final navigation exams with a record of 95 per cent.

However, those four years of active service aboard a crack United States cruiser had taught the prospective cadet one fact which has little or nothing to do with navigation but was strictly social in aspect. Through the open transoms of the ward-room, Rice had heard enough to convince him that he could never overcome the one obstacle; viz., that he was not graduated from Annapolis. "Not that I thought I might be treated with disrespect," was his comment, "but that I was certain I would be treated with too damn much respect!"

Then, although little more than a lad, his term of enlistment having expired, Rice resigned from the Navy and entered the service of the Atlantic Transport Line, a wise decision, for it led eventually, after he had served full time as a cadet, to an opening way down at the bottom of the ladder in the service of the Pacific Mail, Panama division, and on through the regular curriculum until transferred to transpacific ship with the rank of third officer. Thence he went onward and upward until he became the proud commander of the Mongolia, flagship of the fleet, which he guided in her last voyage across the Pacific in 1915.

Three years ago this writer was in Washington, D. C., and one day visited the National Museum, near the entrance of which institution he noticed a coterie of Californians intent in their examination of some object of interest. It proved to be a long naval rifle, and attached to its carriage was a bronze memorial tablet setting forth in time-honored metal letters the following, copied from memory, brief story:

"This is the gun, mounted on the deck of the steamship Mongolia, commanded by Captain Emory Rice, with which he had the honor and courage to sink the first German submarine ever attacked by an American ship of the merchant marine."

Here then stands a fitting monument to the man whom Dr. Leach declared didn't even know the mean-

ing of the word "fear!" Still we are told republics are proverbially lacking in gratitude. This being possibly one of those exceptions meant to prove the rule—whatever that may mean. Anyway it proved that the brave Captain Rice, tired of being chased through that hornet's nest of invisible foes, turned to the offensive and won the day.

Woodget of the Cutty Sark

By Frank C. Bowen

THE passing of that Grand Old Man of the sea, Woodget of the Cutty Sark, will be deplored wherever the old windjammers are loved, for he made a reputation second to none in a day when reputation as a sailing ship captain was hard to make and the standard was terribly high.

All sorts of reasons have been put forward to account for his success while he was in command of the famous clipper, but there is little doubt that the greater part of it at least was caused by two factors.

The first was that he never lost his nerve and never got excited; the hardest blow saw him calmly balancing himself on the poop and quietly chewing the weather end of his moustache, which was his habit when she was tearing through the water.

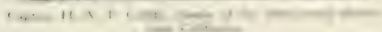
The second was that he learned his craft in the North Country billy-boys, which were about as hard a school that could possibly be found but which did not leave the youngster ignorant on a single subject connected with the sea. While he was at this work he was expected to make himself proficient in rigging as well as sailing a boat, for their owners did not believe in spending good money in the yards ashore. The result was that he knew to an ounce the strain that his rigging would stand, and always made a point of going over every inch of it before sailing. While the Cutty Sark was under his command she lost remarkably few spars, although the clipper captains were notoriously careless in this respect.

For some months past he has been helpless as a result of a stroke, but before he suffered that, although his sailor's eye was dimmed and his famous foretopmast yard voice broken and faint, his handshake was that of a man who must have had colossal physical strength when he was in his prime, and it was always a surprise to anybody who saw his shrunken frame for the first time. He never lost his joy in recounting his experiences in the Cutty Sark, particularly how he used to keep a box of tracts on the poop to scatter into the sea whenever he went romping past another sailing ship—for he knew perfectly well that they were blaspheming on board.

Proposed Standard Medicine Chest and Contents

PRELIMINARY drafts of proposed standards for three sizes of medicine chests and lists of contents have been sent out to the membership of the American Marine Standards Committee for approval.

These proposed standards, Medicine Chests and Medical and Surgical Supplies and Equipment for Ocean-Going Vessels, for coastwise and lake freighters and for small vessels, have been prepared under guidance of the United States Public Health Service. They are tentatively approved by the Technical Committees of the American Marine Standards Committee on Hull Details and on Ship Operation Details and Supplies.

[illegible]

Born in South England, late in 1867, Captain Candy was commissioned in 1886 in the 1st Buffs, and he served first in the Nile campaign, then in the Sudan. He was a member of the Sudanese Staff of the Nile Expedition, and was present at the capture of Khartoum. He was also present at the capture of the Sudanese Capital, Khartoum, and the capture of the Sudanese Capital, Khartoum. He was also present at the capture of the Sudanese Capital, Khartoum, and the capture of the Sudanese Capital, Khartoum.

In 1897 Captain Candy joined the International Navigation Company, serving with the Red Star liner *Kennedy* for a year, then on the *Adriatic* for a year and a half, and then on the *Philadelphia* for a year and a half. He then served on the *Philadelphia* for a year and a half, and then on the *Philadelphia* for a year and a half.

months, and then returned to the Philadelphia until the end of 1920.

The Finland claimed him again in 1921, 1922 and 1923, and the Mongolia in the intercoastal run during the five succeeding years, up to February, 1928, when he was given the California.

Captain Candy, although a very conservative navigator, is keenly alive to all the modern improvements in the equipment for navigation. He is a great believer in the success of navigation in fog by radio bearings, and takes a great interest in studying new methods for quick soundings and for efficient communication be-

Several things had happened since 1990, the year of our first meeting. While my childhood had undoubtedly changed in some respects, that experience in a Berlin training camp lay at the heart of the great sadness I had living "the hard part of life": it was a commitment which could not be compromised, even in my opinion and in the case of my work with African Americans.

IN 1988, nearly 1000 people meeting here tried to achieve peace in the face of the threat of genocide. The national authorities in the past refused to listen to human rights activists, organizations, women, young people and international human rights. From then on, we will move the mobilization of the masses in the government, civil organizations, as well as the "1990" and the people of the State of California.

[illegible]

in line with the construction of a rational term, *Systemic for Approximate*. The term *Small* can be a difficulty, but not a, which were drastically reduced to 0.

In 1996, he was rewarded by solidifying his Pony Express and now being back on the "Iron horse."

There were differing data. The address of the first appearance of the trait in the United States was described in the "Oakland Transcript" of November 8, 1869, in the following rhapsody, which we reprint here from a recent issue of the "Southern Pacific Bulletin":

"There are many of us who remember when the morning trip of the Contra Costa from the foot of Broadway was started April 18, 1866. We arrived at the San Jose Express and who took part in the enterprise, including myself, were the first Pony and the last rider to be carried overally down Broadway and had the first of the first of the first of the first bag of letters.

Today comes thundering into Oakland the great "Iron Horse" with tireless lungs, speeding along with a hundred tons of steel and living freight, seven days from New York. Wonderful transport!

The comparison between that little mustang and the great "Iron Horse"; between that small bag of letters and the train of heavy cars laden with passengers and freight; between the weary galloping of horse flesh and the never tiring force of steam; illustrates the progress of California and crowds the mind with reflections beyond expression."

And now we have the Panama Canal, with palatial passenger steamers making New York in 15 days. Just a few days ago a theatrical agent in a hurry went from New York to Honolulu in 6 days, via airplane and the Malolo; while from Japan comes the news that a son of Nippon has, using existing lines of modern commercial transportation, circled the globe in 33 days.

The 35-Knot Liners

New York, May 7, 1928.

The Editor, Pacific Marine Review. Dear Sir:

Re The Blue Ribbon Line.—The criticism by the committee of the Shipping Board, consisting of Admiral Benson, Admiral Taylor, and Mr. Gibbs, has caused a good deal of surprise in shipping circles. So far as the technical question of speed, consumption, etc., is concerned, these vessels follow generally the elements of large high speed naval ships; data in regard to the performance of these vessels are available and by a very small amount of deduction can be applied to the Blue Ribbon ships. As a result, practical shipping men do not think that there is any unreasonable uncertainty or obscurity in regard to the probable results of speed and fuel consumption, also of sea kindliness of the proposed vessels.

Coming, however, to the question of the probable financial results of these vessels, it seems to me that Mr. Wilder has kept his cards largely "up his sleeve," because when negotiating with the government for mail money and also for the availability of these vessels as airplane carriers in case of national need, he naturally wishes to secure to his company the most favorable terms. Naturally, those who risk their money in this undertaking will also favor the utmost conservatism on the part of Mr. Wilder in this connection. The fact, however, is that in my opinion these vessels would show an adequate margin of profit quite apart from any mail money or other government support.

I understand the intention is to fit accommodations for 800 first-class passengers; also, that it is intended not to exact the maximum fares now imposed by the lines who have the fastest vessels in connection with their first-class accommodations. The minimum fare for a first-class ship at the present time is \$265. I have been creditably informed that the average fare for first-class passengers on these vessels is materially in excess of \$300. Assuming, therefore, that this new company will adopt a minimum fare of \$250, or that it will secure an average of \$250 after deduction of commissions, I feel satisfied that in view of the superior speed of the ships an average passenger list of 75 per cent of the total accommodations will be secured throughout the year.

Having crossed the Atlantic between thirty and forty times, I have become fairly familiar with the psychology of Atlantic passengers, and therefore I feel justified in adopting this estimate, from the standpoint of the additional speed, of the proposed economy in regard to fares, and of the fact that these are American ships intended to bring back the American flag to an adequate position in the Atlantic trade. Assuming, therefore, that these vessels carry 600 first-class passengers each way on an average fare of \$250, this would give each vessel an income from first-class passengers of \$300,000 for each round trip, occupying two weeks. I have made a careful calculation of the expenses attached to such a round voyage, and feel assured that these, after allowing for depreciation, insurance, administration, etc., will still leave an ample percentage of profit for the probable investors in the company. When the appeal for capital is made, I am sure the promoters can submit figures which will readily attract the support of finance.

The drawback to the conservative criticism of this proposal is that it is bold and original and somewhat out of harmony with the more conservative practice of existing shipping companies in the Atlantic trade, who

are wasting valuable space for royal suites, swimming baths, and other luxuries which will not attract the average American or European traveler on whose support the success of the Blue Ribbon Line will depend.

Yours truly,

Naval Architect.

Care of Merchant Seamen

THE merchant seaman, and particularly the seaman in foreign trade service, is, under all civilized law, regarded as peculiarly the ward of the government. In the United States this established status of seamen has led to much governmental work for their welfare and to the building and maintaining of many fine, conveniently located hospitals for the care of sick and convalescent A.B.'s. In appreciation of this service, The Marine Section News Letter of the National Safety Council broadcasts the following information.

While the United States Public Health Service performs many functions on behalf of merchant seamen, and while many activities have been established from time to time for the purpose of rendering more efficient care and safeguarding the health of seamen on sea as well as on land, the greatest service rendered is naturally through the marine hospitals and other relief stations of the service.

Knowledge of the needs of the seamen, their exposure to health hazards, and the necessity of providing hospital and dispensary treatment for them led to the establishment in 1798 of the Marine Hospital Service. The bill creating this service was signed by President John Adams, the third president of the United States.

Following the passing of the law establishing the Marine Hospital Service funds were provided for the erection of hospitals at various ports in the United States. All merchant seamen are cared for in these hospitals. American seamen are cared for free of charge and foreign seamen are cared for in hospitals and out-patient officers at rates fixed by the Secretary of the Treasury. At the present time the rate is \$3.80 per day in hospitals and \$1 a day in out-patient offices.

Ten years ago the hospitals of the Public Health Service had an aggregate capacity of 1500 beds. Equipment and trained personnel, exclusive of physicians, were limited. Today all hospitals are fully equipped, trained personnel has been assigned, and the hospitals compare very favorably with civilian or state institutions in the cities where they are located. The bed capacity has increased from 1500 to 3600, and it is hoped that existing facilities will be expanded to meet the ever-increasing needs of the service. The number of patients has more than kept pace with this increase in hospital beds, and it is still necessary that some patients be cared for in civilian hospitals. Authority has been given to build new and modern hospitals at both Cleveland and Detroit.

In 1919 a nursing service was established, and nurses were assigned in all hospitals and in the larger dispensaries of the service. Dietitians are responsible for the food service. Physiotherapists give treatments in hydrotherapy, electrotherapy, and massage. In the hospitals also are ear, nose, throat, eye and dental clinics. Each hospital has its ward for the treatment of venereal cases. Tuberculosis patients are cared for in all hospitals of the service. There is one sanatorium of 236 beds for tubercular seamen, U. S. Marine Hospital No. 9, Fort Stanton, New Mexico, but the tubercular seamen are admitted to all other hospitals.

Presidential Messages on Merchant Marine

Opinions of the Majority of His Predecessors Endorse President Coolidge in His Approval of the White-Jones Bill

THE consensus of the United States of America has long been and evermore remains, "Free navigation of the seas for the benefit of mankind" from Presidential messages:

President Washington in his annual message to Congress in 1790 said:

"It cannot but appear that freedom of seas is one of the rights which nature has given to man, and that the laws of humanity and justice require that the laws of nations should be so framed as to secure to every nation the free use of the seas for commerce and navigation. It is the duty of the United States to see that the laws of nations are so framed as to secure to every nation the free use of the seas for commerce and navigation. It is the duty of the United States to see that the laws of nations are so framed as to secure to every nation the free use of the seas for commerce and navigation."

Afterwards President John Adams in 1796 said:

"You may remember that in the summer of 1795, I had the honor to send the United States to the Congress generally passed a resolution to the effect that the United States should not be bound by the laws of nations, but that the laws of nations should be so framed as to secure to every nation the free use of the seas for commerce and navigation."

President Jefferson in 1801 said to Congress in his annual message:

"The principle of the law of nations is that all the nations of the world are equal in the eyes of the law, and that the laws of nations should be so framed as to secure to every nation the free use of the seas for commerce and navigation. It is the duty of the United States to see that the laws of nations are so framed as to secure to every nation the free use of the seas for commerce and navigation. It is the duty of the United States to see that the laws of nations are so framed as to secure to every nation the free use of the seas for commerce and navigation."

President Madison in 1809 said to Congress in his annual message:

"Old Hickory" President Andrew Jackson in 1829 said to Congress:

"It is indisputable that whatever gives facility and security to navigation cheapens imports; and all who consume them are alike interested in whatever produces this effect. . . . The consumer in the most inland state derives the same advantage from every necessary and prudent expenditure for the facility and security of our foreign commerce and navigation that he does who resides in a maritime state."

President Madison, as a representative from Virginia and afterwards as President, made many eloquent

statements during his term in the office of legislation based on freedom and freedom of the seas. For example, Madison said in his annual message to Congress in 1801:

"The principle of the law of nations is that all the nations of the world are equal in the eyes of the law, and that the laws of nations should be so framed as to secure to every nation the free use of the seas for commerce and navigation."

In 1844 President Tyler said in his annual message to Congress:

"I cannot too strongly urge the policy of authorizing the construction of a line of steamships regularly to sail between the United States and foreign ports, and about the world, for the transportation of the mail. The strength of the United States is much worthy of the strength of the United States."

The same line is further continued by President Polk in 1845. He said:

"The government policy for several years past has been to build up a line of steamships regularly to sail between the United States and foreign ports, and about the world, for the transportation of the mail. The strength of the United States is much worthy of the strength of the United States."

In 1861 President U. S. Grant sent a special message to Congress, from which the following excerpt is taken:

"It is a national humiliation that we are now compelled to pay from twenty to thirty million dollars annually exclusive of passage money which we should make with honor of other nations. In response to the call of the United States, the United States should be the first to build up a line of steamships regularly to sail between the United States and foreign ports, and about the world, for the transportation of the mail. The strength of the United States is much worthy of the strength of the United States."

Again in his annual message of 1870, President Grant says: "Our depressed commerce is a subject to which I called your special attention at the last session. The fact exists that the carrying is done almost entirely in

foreign bottoms, and while this state of affairs exists we cannot control our due share of the commerce of the world."

The annual message of **President Hayes** in 1877 urges practical legislation.

"The commerce of the United States with foreign nations has of late years largely increased; but the greater part of this trade is conducted in foreign vessels. It is a matter of great moment that our own shipping interests should receive to the utmost practical extent, the benefit of our commerce with other lands. These considerations are forcibly urged. . . . And it is not doubted that Congress will take them up in the broadest spirit of liberality and respond to the public demand by practical legislation upon this important subject."

Again in 1880 he calls attention to this fact:

"Especially important is it that our commercial relations with the Atlantic and Pacific Coasts of South America, with the West Indies and the Gulf of Mexico, should be direct, and not through the circuit of the European systems, and should be carried on in our own bottoms."

"In his annual message 1884, **President Arthur** fully outlined a plan for preferential treatment to American vessels engaged in direct trade with nearby countries; and in his special message of December 19, submitting the same in a proposed treaty with Spain, having particular reference to Cuba, he pointed out the 'many immediate and prospective advantages which will flow from this convention of our productions and shipping.'"

In his message of 1882, **President Arthur** had urged the importance of encouragement for American shipping:

"This subject (shipping) is of the utmost importance to the national welfare. Methods of reviewing American shipbuilding and of restoring the United States flag to the ocean-carrying trade should receive the immediate attention of Congress."

In 1884 **President Benjamin Harrison** advised Congress that:

"There is nothing more justly humiliating to the national pride and nothing more hurtful to the national prosperity than the inferiority of our merchant marine compared with that of other nations whose general resources, wealth, and seacoast lines do not suggest any reason for their supremacy upon the sea. That the great steamship lines sailing under the flags of England, France, Germany, Spain, and Italy were promoted and have since been and now are liberally aided by grants of public money is generally known. I am an advocate of economy in our national expenditure, but it is a misuse of terms to make this word describe a policy that withholds an expenditure for the purpose of extending our foreign commerce. The enlarged participation of our people in the carrying trade, the new and increased markets that will be opened for the products of our farms and factories, and the fuller and better employment of our mechanics which will result from a liberal promotion of our foreign commerce, insure the widest possible diffusion of benefit to all the states and to all our people."

And in 1892 he urged subsidy:

"Our great competitors have established and maintained their lines by government subsidies, until they have now practically excluded us from participation. In my opinion, no choice is left to us but to pursue, moderately at least, the same lines." Because he was convinced that:

"The United States has been paying an enormous annual tribute to foreign countries in the shape of freight and passage money. The balance of trade as shown by the books of our custom houses has been largely reduced, and in many years altogether extinguished by this constant drain. I have felt, and have before expressed the feeling, that this condition of things was both intolerable and disgraceful."

President Cleveland states the crux of the matter very trenchantly in his message of 1894—

"The millions now paid to foreigners for carrying American passengers and products across the sea should be turned into American hands."

President McKinley, in the annual message of 1899, holds that:

"Our national development will be one-sided and unsatisfactory so long as the remarkable growth of our inland industries remains unaccompanied by progress on the seas. There is no lack of constitutional authority for legislation which shall give to this country maritime strength commensurate with its industrial achievements and with its rank among the nations of the earth."

In his last speech, he declares that:

"We must encourage our merchant marine. We must have more ships. They must be under the American flag, built and manned and owned by Americans. These will not only be profitable in a commercial sense; they will be messengers of peace and amity wherever they go."

The great "**Teddy**" **Roosevelt** was a loyal friend of merchant marine and navy, and much "**Big Stick**" activity was in evidence on their behalf.

"Ships work for their own countries, just as railroads work for their terminal points. From every standpoint it is unwise for the United States to continue to rely upon the ships of competing nations for the distribution of our goods. It should be more advantageous to carry American goods in American-built ships."

In his annual message of 1901 he declares:

"The condition of the American merchant marine is such as to call for immediate remedial action by the Congress. It is discreditable to us as a nation that our merchant marine should be utterly insignificant in comparison to that of other nations which we overtop in other forms of business. We should no longer submit to conditions under which only a trifling portion of our great commerce is carried in our own ships. To remedy this state of things would not merely serve to build up our shipping interests, but it would also result in benefit to all who are interested in the permanent establishment of a wider market for American products, and would provide an auxiliary force for the navy."

Again in his last annual message he urges the consideration, that:

"To the spread of our trade in peace and the defense of our flag in war a great and prosperous merchant marine is indispensable. We should have ships of our own and seamen of our own to convey our goods to neutral markets, and in case of need, to reinforce our battle line. I ask your earnest consideration of the report with which the Merchant Marine Commission has followed its long and careful inquiry." (Report of Galinger Commission).

President Taft, in 1911 calls the attention of Congress to the dilemma of the merchant marine:

"All the great commercial nations pay heavy subsidies to their merchant marine, so it is obvious that without some wise aid from Congress the United States

(Continued on Page 249)

White who in his report to the House said he believed he was reporting a bill which was responsive to the wishes of the American people, opened the debate. For an hour he stood before the House and outlined the purposes of the measure and pointed out the necessity of its enactment. He asserted among other things that during the past the ships of thirty-three countries have taken part in the carriage of ocean commerce of the United States. He made it clear that passage of the bill would result in the speedy building up of an American merchant fleet in private hands, sufficient to transport the major portion of the commerce of this country.

Representative Davis of Tennessee, minority leader of the committee, was in perfect harmony on the shipping measure and made the positive statement that an immediate boom in shipbuilding in American yards would follow enactment of the shipping bill.

In the opinion of the committee there has been no time within three-quarters of a century in which the country has been so interested in an American merchant marine and so anxious that the Congress should provide the ways and means for restoring to the American ship that prestige which was once the nation's pride. There is a tone of optimism all the way through Chairman White's lengthy and comprehensive report. An idea of his views may be gleaned from the following pungent paragraph:

"Your committee member have faith in the legislation presented to you. It gives to the American ship greater aids than have been provided by any legisla-

tion within three-quarters of a century. We believe its enactment means the building of new vessels of greater speed than any now flying our flag; that it will revive the shipbuilding industry; that it will stimulate an increased use of American ships for American cargoes; that it will give us a larger measure of industrial and commercial independence; that it will provide us with naval auxiliaries for the day of stress; and that it will carry to all the world notice of our settled purpose to retain upon the seas that which we now have and of our determination in due process of time to build and maintain a merchant marine of a size and efficiency commensurate with our national interests and our national dignity."

By unanimous consent the House passed two bills reported by the Merchant Marine committee with particular reference to Great Lakes shipping. One of the measures is designed for the purpose of minimizing the danger of collisions and requires the display of deck lights at every interval of one hundred feet of a vessel's length when she is at anchor, the placing of two lights on the after spar and placing of lights on both sides of the keel.

The second bill applies to all tugs up to 100 tons, net register, whose principal business is harbor towing, the same regulations as to lights as now apply to tugs of 30 tons register and under. This is to obviate the necessity of the larger tugs having high masts, which are technically required under existing law, but which in actual practice would be an unjustifiable hardship on harbor tugs.

Presidential Messages on the Merchant Marine

(Continued from Page 247)

must lag behind in the matter of a merchant marine."

In 1914, this dilemma had become very critical, and **President Wilson** asks a solution and suggests a remedy:

"How are we to build up a great trade if we have not the certain and constant means of transportation upon which all profitable and useful commerce depend? And how are we to get the ships if we wait for the trade to develop without them? The Government must open these gates of trade, and open them wide; open them before it is altogether profitable to open them; or altogether reasonable to ask private capital to open them."

Again in 1915 he proposes ships:

"Moreover, we can develop no true or effective American policy without ships of our own—not ships of war, but ships of peace, carrying goods and carrying much more; creating friendships and rendering indispensable services to all interests on this side of the water. They must move constantly back and forth between the Americas. They are the only shuttles that can weave the delicate fabric of sympathy, comprehension, confidence, and mutual dependence in which we wish to clothe our policy of America for Americans."

In the message of 1922, **President Harding** urges "Government Aid" for the merchant marine, proposing that:

"If 'Government Aid' is a fair term—and I think it is—to apply to authorizations aggregating \$75,000,000 to promote good roads for market highways, it is equally

fit to be applied to the establishment and maintenance of American market highways on the seas. If Government Aid is the proper designation for fifteen to forty millions annually expended to improve and maintain inland waterways in aid of commerce, it is a proper designation for a needed assistance to establish and maintain ocean highways where there is actual commerce to be carried. . . . We have aided industry through our tariffs; we have aided railway transportation in land grants and loans; we have aided the construction of market roads and improvement of inland waterways. We have aided reclamation and irrigation and the development of water power, and we have loaned seed grains in anticipation of harvests. We expended millions in investigation and experimentation to promote a common benefit, though a limited few are the direct beneficiaries. We have loaned hundreds of millions to promote the marketing of American goods. It has all been commendable and highly worth while."

President Coolidge declares that "the generous maintenance of an adequate merchant marine is of the utmost importance to our national defense and the service of our commerce."

Very recently, **Herbert Hoover**, that great mining engineer and statesman, our Secretary of Commerce, and the most prominent candidate for the election to the presidency, sums the whole matter up in a single sentence:

"It is simply a truism that we must have an American overseas merchant marine."

Marine Terminal Operation

Some Suggestions for Reduction of Costs at that Point in Steamship Operation Where Waste is Most Apparent and Economy is Least Stressed

By William C. Hinton, President
Terminal Engineering Company, New York

A N AFFAIR of the kind known as Pacific Marine Review, written by Thomas P. Stone, directed the development of the mechanical equipment on the deck of modern steamships. The April 26 day to come was held at Philadelphia for the national meeting of the Maritime Industries Division of the American Society of Mechanical Engineers. At this meeting, William C. Hinton, consulting engineer of that firm and president of the Terminal Engineering Company, made a paper on Marine Terminal Operations, showing the need, first, with some general suggestions, as to the modernization of the terminal facilities.

“The terminals have usually been designed by the civil engineering school through law time the modern water transportation. The general outline of the port which affects all of the basic handling, has received considerable more attention. All elements and most of the work for the freight motion of any port should be directed against the mechanical engineering function. It is practically impossible to properly fit the mechanical engineering into the civil engineering after the terminal is completed. Take, for example, the matter of selection for loading cranes. These cranes are usually large enough, and they are often mounted on so many unnecessary components in freight handling. In ports where cranes are used, they should be equipped with ranges for permit moving cranes to move in and off bays. A good location of such cranes requires in itself very little study. Many ports are built with one side cranes in bays, but throughout the whole life time of that port there will be continuous bays and delay for freight handling and movement of cargo in cargo.

The use of mechanical equipment at steamship terminals is usually taken for granted and remarkable efficiency without increase in cost. There is nothing to prevent even lower cost service to ports which have good mechanical power service. Freight terminals are from now on the things to get more open. In New York, for instance, the use of William C. Hinton's work are regularly demonstrated and point to better port service of a new way from the world.”

Mr. Hinton also made a plea for mechanical engineering in the operation of marine terminals. Of these operations in their relation to the over-all economy of marine transportation, he says:

“The function of a ship is the transportation of passengers or freight between ports. When a ship is in port it is not functioning. For a steamship line in foreign trade or intercoastal work, approximately one-half of the total business is spent in terminal activities. The maintenance of continuous service of a foreign or intercoastal shipping line requires a number of ships. Operations are probably in a large scale and the annual budget of any such line runs into millions.

There is usually no single individual who makes a specialty of all these activities of port organization for which millions of dollars are spent yearly and which so greatly affect the success of the undertaking.

The superintending engineer or marine superinten-

dent of a steamship line, who may be able to do so, usually has but little of experience in New York. It is almost a fact to be noted that he has not had the most of his operations at one or a few ports where it would be difficult for him to obtain the knowledge he needs and is not getting along with the same as he is not getting along with the same. It would mean that the man who has made these terminal movements for the operation of ship machinery must be able to do so in a manner to ensure the most efficient terminal operation. However, they do not usually have sufficient time for the terminal work, and perhaps consider it outside of their duties. There has been too much of a tendency to consider terminal work as a matter of dividing time between it and other work with no other work to be done.

Whether the large ship is at the present time there are no more than that in the terminal operations of shipping companies with the same knowledge, but to ensure maximum efficiency.

Essentially all of the problems of a ship in port are of such complexity that a highly organized mind is needed for efficient solution. Ships should be designed with a definite relation to the port. In so far as possible the ship and port should be designed together. Now, as we have seen, the port needs of ship design much less attention than is deserved. Yet during the last few years quite remarkable improvements have been made in ship design tending to increase the speed and reduce the cost of a ship at sea. We now have steam turbines, geared turbine drive, diesel engines, pulverized fuel and more than 100 other methods for power plant in steamships. The result is that the efficiency of a ship and its fuel consumption at sea have increased the same as the port operation and the same cost of port service has stuck up like a sore thumb.”

The ship operator has said that it costs more to put the cargo into a ship and take it out at the other end than to move it from New York to San Francisco. Of the port activities stevedoring bulks so large that any increase in wage rates or decreases in effectiveness of labor seriously affects the owner of a ship. The work of loading ship cargo is not only severely arduous, but the heaviest work is frequently done. Compared with most of the other occupations in the world, it is very unattractive. The men themselves must realize that and may be justified either in leaving the field entirely or in asking still higher wages to cover the muscular strain and the danger hazard involved.

For the last few decades ocean carriers have been fully controlled under foreign flags. Our intercoastal business dates only since the opening of the Panama Canal and was much upset during the World War. American terminals have in many instances been managed by men in the employ of foreign steamship lines, temporarily assigned to authority in any American port. These men have been thousands of miles from home and have had difficulty in getting authorization from abroad for making any innovations or expenditures at American terminals. Under such circum-

stances, should there be surprise that progress has been slow?

There is a more progressive spirit at Pacific Coast terminals than on the Atlantic Coast. However, the Pacific Coast piers are of recent construction, and the methods of operation have evolved according to the needs without being so heavily handicapped by precedent. But even on the Pacific Coast there is still almost unlimited opportunity for bettering terminal performance."

The Sorting Evil

Mr. Brinton cites many specific suggestions for improvement. For instance, here are a few trenchant remarks on the sorting evil.

"Sorting of discharged cargo costs hundreds of millions of dollars yearly and practically nothing is being done to remove the cause. Fundamentally, sorting is due to the small size of the packages of freight. Packages have been made man size rather than machine size. The chief difficulty in sorting lies in the lack of co-operation between the loading and unloading organizations at the two ends of the ship's run. Ships are often scheduled to stop at many ports and the sorting involved at the point of discharge is a composite of the loading methods at all points of origin.

Unless some one man or group of men is constantly studying this situation, unnecessary costs due to sorting of cargo are sure to result. Of course, not all cargo can be stowed simply, as it is frequently necessary to pack the smaller packages between the larger cases of machinery, etc. Because of the diversity of the American manufactured products there are all kinds of sizes and shapes exported. Typewriters must be loaded with locomotives. Discharging a cargo of diversified manufactured products is justifiably more complicated than the handling of the raw materials imported into this country and discharged at American ports. We should be able to improve greatly on the methods of discharging in this country since much of the inbound freight comes in large lots of one size or kind of package."

Packages

"Why," asks this interesting paper, "are we worried with all these various odd shapes, sizes, and weights of packages?"

"Consider plantation rubber from the East Indies. The material is so valuable that each package is checked and rechecked. There might be as many as 100 separate clerical transactions in the history of any case of rubber from the time it obtains its identity to the time its existence ends in an Akron rubber mill. Why did it happen to be a nearly cubical package with six faces, any one of which might contain the elusive identification mark? The weight, around 220 pounds, is heavy for Malay physique and is too light for effective machine operation. If rubber were packed in packages of 1000 pounds, or even 2000 pounds, sorting would be simplified, since power equipment could readily take each package to its proper pile and quickly stack it as high as desired. Larger packages would automatically reduce not only the danger of theft but, in the ratio in which the packages are made larger, reduce clerical work, weighing and sampling.

How did it happen that, in this same East Indian territory, burlap has long been shipped in large bales weighing from 1000 to 1500 pounds? A package of this

kind is large enough to be economically handled by machinery carrying one package at a time directly from shipside and tiering on the pier 12 feet high with negligible cost for the tiering.

Another good type of package for mechanical handling on piers is newsprint paper in 6 foot rolls weighing about 1300 pounds each. By special attachments on electric trucks this paper has been handled from ship side at the rate of from 40 to 50 rolls per hour, per truck, sorted and stacked four rolls high on the flat, without a human hand touching the paper after landing on the pier.

Customs weighing of imported cargo by the United States Government employees has long been by antiquated methods with great expense and delay. If mechanical equipment is used there are many possibilities for moving the freight over scales in the course of the regular operations, thus eliminating rehandling and consequent delay to valuable freight.

Better design of ships from a cargo standpoint may result in making many ships almost obsolete within the next few years. The problem has been so little studied that it is impossible to foretell the nature of the changes. Whatever they may be, however, it is pretty safe to predict that they will be revolutionary.

The high accident rate and great insurance expense should be sufficient to get the ship owner's attention. It has been proved on the Pacific Coast that most marine accidents can be eliminated by competent engineering study. Accident-prevention work alone is sufficient justification for more engineering-minded men at ship terminals. The use of more machinery and less hand labor is definitely known to reduce accidents. Reduction of accidents automatically gives better economic cost.

Men properly qualified to make improvements in ship-terminal operation do not exist in any great number. Perhaps the easiest way to make a beginning would be to have carefully picked men put in training for this work and serve first on a purely staff basis, reporting directly to the general manager. Connection with the general manager's office is suggested primarily because only at the top are there any cost or statistical figures available to stimulate imagination and spur one on to making further studies. No two cargoes are alike, and the business may change entirely at different seasons of the year. A rough and ready ability to think in terms of statistics is desirable. A beginner should be warned, however, against trying to prove too much by cost figures or even the simplest motion studies. The operations are usually so crude that the problem becomes primarily one of judgment and ingenuity. A valuable process for quick test purposes lies in comparing two methods by balancing one against the other, factor by factor, and quickly ascertaining which method has one or more predominating advantages. After some experimenting, the investigator will gain confidence in his own judgment and know almost instinctively when a freight-handling operation is moving properly without using a stop watch or other timing methods.

Marine-terminal work is more than usually interesting, and there should be no difficulty in getting the right type of men to enter the field if they are assured proper cooperation and support. There is a need for more men who speak the language, which need not necessarily be profane."

piston at the end of its stroke, or $\frac{1}{2}$ M.V.²

$$\frac{1}{2} MV^2 = F.S.$$

$$(1) 0.013675 V^2 = 47.3$$

$$V = 3460$$

$$(2) V = 58.8 \text{ feet per second where piston strikes rivet die.}$$

$$\text{Also } FT (\text{impulse}) = MV (\text{momentum})$$

$$(3) T = \frac{M.V.}{F} = \frac{0.02736 \times 58.8}{71} = 0.02267 \text{ second}$$

This is the time required for piston to travel the length of barrel of air gun during which travel it attains a velocity of 58.8 feet per second.

As a counterpart of the riveting hammer, manufacturers of pneumatic equipment furnish a device called a holder-on for the purpose of backing up the rivet and holding it firmly in place while the pneumatic hammer is forming the point and upsetting the rivet in the hole. The principal characteristics of this device are:

Diameter of piston 3-1/8 inches;

Area of piston 7.67 square inches;

Air pressure 80 pounds per square inch;

(4) F, or the pressure exerted by the piston=

$$7.67 \times 80 = 613.6 \text{ pounds;}$$

Weight of piston and die for head of rivet $11\frac{1}{4}$ inches;

$$M = 11\frac{1}{4} / 32.16 = 0.35$$

Assuming that the maximum energy to be absorbed by this holder-on is equal to the work delivered by the hammer, or (1) 47.3 pounds per stroke, we have the following conditions of operation of the holder-on:

$\frac{1}{2}$ M.V.²=47.3 from which $V=16.43$ feet per second or the speed of the H.O. as it reacts from the rivet head.

$$(5) \text{ Also } T = \frac{MV}{F} = \frac{0.35 \times 16.43}{613} = 0.00937 \text{ seconds.}$$

$$(6) S = \frac{VT}{2} = \frac{16.43 \times 0.00937}{2} = 0.0771 \text{ feet.}$$

Therefore, the piston in the holder-on travels a distance of 0.0771 feet in 0.00937 seconds and comparing this performance with the action of the hammer, it is evident that the holder-on will be on the head of the rivet before the hammer can deliver a second stroke. The ratio of times being about three to one in favor of the holder-on.

The mechanical process of riveting requires that means be employed to compress the rivet until the metal of the rivet completely fills the registering holes in the members to be joined. Also sufficient head or countersink should be formed on either end of the rivet. The rivet should be formed in a manner to retain a considerable tension on the rivet as driven to induce frictional resistance as well as rivet shear to prevent motion under stress between the elements joined. The variation in longitudinal stiffness among ships, particularly tankers, of equal scantlings may be attributed to methods of riveting and "bolting up" employed.

A compression riveter (air or hydraulic) is ideal to meet this condition, providing the compression is retained until the driven rivet is sufficiently cooled to retain the rivet tension without elongation.

The pneumatic hammer will accomplish the same result (within its capacity) providing each blow of the

hammer is supported by the holder-on in contact with the rivet head. If not so backed up, the blow is wasted as there is no work done to upset the body of the rivet. On the contrary, a considerable damage is done to the finished rivet as the reaction from the unsupported blow of the hammer is absorbed by the bottom of the countersink, or the under side of the snapped head to the end that the body of the rivet is relatively lengthened and furthermore if this condition occurs near the finish of the driven rivet the result is a loose or leaky rivet regardless of the amount of work expended. Hand riveting is often referred to as producing better workmanship. The reason is evident as the blows from the hand hammer are not sufficiently rapid to prevent the holder-on meeting each blow with his dolly bar. Should the holder-on miss connections, the result is often a signal for profuse anti-compliments among the riveting gang.

A fitting up bolt may be tightened by an extension wrench and the faying surfaces may be in solid contact. If, however, the head of the bolt be struck a few sharp blows with a pneumatic or hand hammer, the nut may be easily removed. It therefore seems logical that to drive tight rivets the work be done in a manner consistent with the laws of mechanics.

Consider further the action of the air holder-on with particular reference to the force necessary to be applied to return the holder-on to the head of the rivet in time to register with the stroke of the hammer.

Let F represent the force required as above,

Let T represent the time of stroke of riveting hammer=0.02267 second,

Let W represent the weight of air-piston and die in H.O.=11.25 pounds,

Let M represent the mass of air-piston and die in

$$\frac{11.25}{32.16} = 0.35,$$

Let S represent the distance travelled by H.O. from rivet head,

Let V represent the velocity of H.O. when leaving rivet head 16.43,

Then $FT = MV$

$$F = \frac{MV}{T} = \frac{0.35 \times 16.43}{0.02267} = 254 \text{ pounds}$$

$$S = \frac{VT}{2} = \frac{16.43 \times 0.02267}{2} = 0.1862 \text{ feet}$$

Assume rivet as above being held on by a dolly bar weighing (for convenience) 32.16 pounds.

V=Velocity of dolly bar leaving rivet.

F=Force necessary to be used by H.O. to stop bar in time of hammer, stroke or 0.02267 second.

$$M = \text{Mass of bar} = \frac{W}{G} = \frac{32.16}{32.16} = 1$$

S=Space travelled by bar from rivet head

T=Time of one stroke of riveting hammer=0.02267 second

$$\frac{1}{2} MV^2 = 47.3 = \text{work done by riveting hammer}$$

$$\frac{1}{2} \times 1 \times V^2 = 47.3, V = 94.6, V = 9.72 \text{ feet per second.}$$

$$F = \frac{MV}{T} = \frac{1 \times 9.72}{0.02267} = 428.7 \text{ pounds}$$

Navigation at Sea and in the Air

A Description of the New Method Recently Taught to and Approved by
Colonel Charles Lindbergh

By P. V. H. Weems, Lieutenant-Commander, United State Navy.

THIS article is the writer's opinion of what should comprise the equipment and methods for celestial navigation. Piloting, dead reckoning and compass work are omitted.

A complete list of the items of equipment for navigation follows:

1. Sextant, bubble type.
2. Two chronometer watches, one set to Greenwich civil, and one to Greenwich sidereal time.
3. Nautical almanac.
4. Charts, chart board, and either parallel rulers or a drafting machine. A drafting machine is handier.
5. Chosen method of working the line of position. The latest method is that given in the "Line of Position Book," which is meeting the approval of the navigators who have tried it.
6. Dividers, pencil, and work book.
7. Two-star altitude curves for use at night.

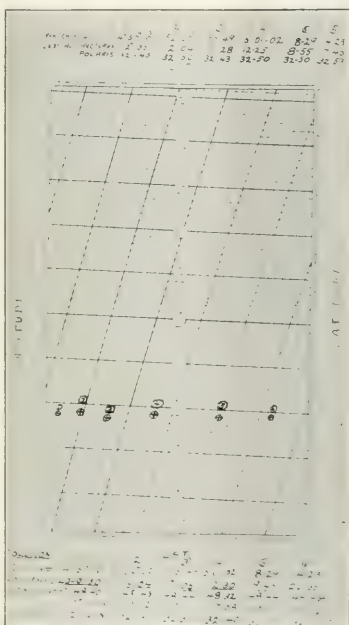
The writer has used a Bureau of Standards Navy bubble sextant for several months, during which time he has taken several hundred ob-

servations. Without a doubt this sextant would be a convenience to the navigator, and is a great improvement over the old style bubble

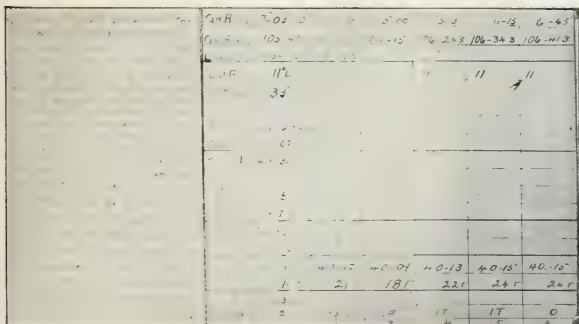
sextant where a spirit level was attached to an ordinary sextant. In the old style sextant with bubble attachment, it was necessary to bring the body, the bubble, and the bubble marks together. This means that three objects must be viewed simultaneously, an operation which is about as easy as "rubbing the tummy and patting the head at the same time." With the Bureau of Standards sextant, it is only necessary to bring the observed body to the center of the bubble, when the latter is approximately at the center of the field. This operation can be done so easily that at first one is inclined to consider the method crude. As a matter of fact, results using this sextant are surprisingly close. Lincoln Ellsworth, on first trying out this sextant, made the observation, "It certainly looks crude to give such accurate results." This sizes up the matter perfectly. When used as a horizon sextant, this sextant is practically as accurate as a horizon sextant. When the bubble is used, there is an inaccuracy due to motion of the ship. Yet a sight with an error of ten miles is better than nothing. While an ordinary horizon sextant is an accurate instrument, a bubble sextant with horizon feature offers many advantages.

Another feature of the Bureau of Standards sextant which is especially good for night work is the fact that a star may be viewed direct through a plain glass, making it almost as easy to pick up a star as it is to see it with the naked eye. The bubble is lighted up by a small electric light controlled by a rheostat. When observing the sun, the bubble is viewed direct while the sun is reflected.

The sextant is handy to operate, light (2¼ pounds), compact, and easy to read. There is a small reading light for night work. Altogether, the Bureau of Standards sextant, while defective in minor details, is a highly satisfactory instrument and a great improvement over the old style sextant, with bubble attachment. Only six of these sextants were made, but an attempt is being made to induce the manufacturers, Bausch and Lomb Optical Company, to correct certain minor defects and to put the instru-



Sample page of two star altitude curves, with solution of six problems.



Sample sights worked by the Line of Division Book on the Weems method.

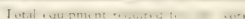
rect time to navigators of small craft.

"With the accuracy of the new sailing clock, the vast amount of time can now be kept and used more judiciously than ever before," says the inventor. "The clock will tell the correct time within a second, if you set the clock 760 feet back in the water to the exact second of time. The second second clock is a new invention, and a great cut saving of 100,000 feet. The first of these watches was made at 100,000 feet in the Coast Survey, New York, and is now in the hands of the U. S. Navy."

[illegible][illegible]

promising method, such details as the scope, scale, and arrangement had to be worked out. A rather ambitious plan has been launched by the United States Coast and Geodetic Survey. A chart of the North Atlantic, from thirty to eighty degrees north would be covered by a single sheet of paper, the width of the sheet being the same as the length of the chart. The scale would be about 75 miles to the inch. Two general arrangements are suggested. The chart may be made in one continuous sheet and kept on rolls, or it may be made up in sections and bound in book form. It is planned to produce the curves in both roll and book form. The former being somewhat handier for the air navigator or avigator, while the latter may be made more compact and at a smaller cost. It is convenient to have a roll or a book for each ten degrees of latitude, or some perhaps will prefer to have latitude twenty to fifty north in one volume, as this would include the United States except the extremely southern part.

These curves are made by plotting the altitude against latitude as the ordinate and with local sidereal



time as the abscissa. H.O. 203 and H.O. 204 (Hydrographic Office tables) were used in computing the points on the curves.

In the construction of the curves, we interpolate for the star's exact declination, thereby avoiding the combination of latitude and declination of like and unlike signs required in methods of general application. Similarly, since a star has a nearly fixed right ascension (over a considerable period of time) we may combine the right ascension with the hour angle and use the resultant local sidereal time. This, in effect, eliminates from our problem both right ascension and local hour angle. Each curve of altitude is the loci of corresponding values of latitude and local sidereal time. If we choose a time we obtain a definite latitude, while if we choose a latitude on the curve, we obtain a definite time. An intersection of two altitude curves gives us a definite point, which determines at once a latitude for those altitudes, and a corresponding local sidereal time. Since the difference in time between the Greenwich and the local meridian is our longitude, to obtain a definite fix by means of the curves, it is only necessary to observe or compute the Greenwich sidereal time of the simultaneous observations, then with the intersection of the two altitude curves to read the latitude and the local sidereal time from the proper scales, and to take the difference between the two times for the longitude.

Theoretically, we must have simultaneous observations for two fixed stars. Practically, however, if we use Polaris for one of the pair, we need not take the time when the altitude of Polaris is observed, since its altitude varies so slowly as to be a negligible amount in ordinary sights. When necessary, the change of altitude due to change of position and the change of altitude due to interval of time between the observations of the two stars should be taken into consideration.

It will be noted that the simultaneous altitudes and time of observations of two stars definitely determine a fix without reference to the dead reckoning position. This last point is a most important one in navigation for the reason that one's dead reckoning position may be so much in error that plotting by the usual methods would be impracticable, even assuming that the computations could be made.

The Greenwich sidereal time of

observation is required. The conversion of mean time into sidereal time is, alone, no small item. Fortunately, we may get around this difficulty by the common sense procedure of keeping watch set to Greenwich sidereal time (GST). The GST may be kept to the exact second by having a movable second dial, so that seconds may be set.

Still another short-cut may be made in the construction of the curves: the bubble sextant correction, i.e., the parallax and refraction, may be included in the construction of the curves with the result that the sextant readings (if there is no index error) may be used to find the intersection on the curves. Thus by having a watch which will give us the exact GST, and a sextant whose readings are used directly on the curves, the total computation for obtaining a fix is one subtraction of time for longitude. The latitude scale is plotted to the scale of the Mercator projection, and the point of intersection serves as a record of the latitude as well as of both altitudes. There is no need to write down the latitude, since it is shown to scale on a Mercator projection. Also, the longitude may be left in time units, and the work of conversion to arc thereby saved. The fact that there is so little writing to do is a big advantage.

Since only one subtraction is required, this may be written directly on the page near the point of intersection, and by numbering the longitude to correspond to the points of intersection a permanent

record is kept of the work. The time of solution requires less than thirty seconds after the altitudes are observed. On test, the writer did the complete operations of taking two sights and obtaining a fix in 55 seconds. As it happened in this case, the latitude found was exact, and the longitude only one minute of arc in error. The average error on a steady platform should run less than four miles when a bubble sextant is used. The curves can do no more than give a correct solution for the altitudes and time used, and when the correct data are used, the solution by the curves should be correct within three miles at all times.

To enumerate the advantages of this method we have:

(a) **Speed.** Positions may easily be found in less than two minutes.

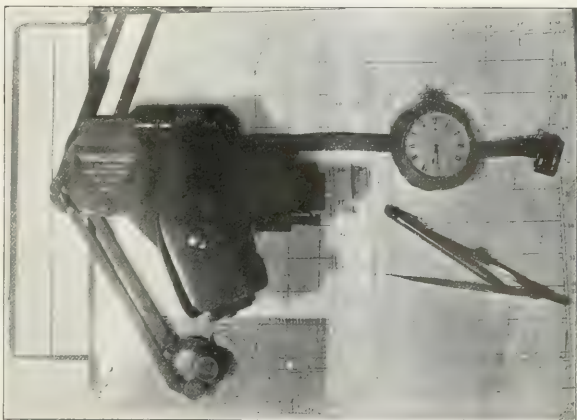
(b) **Simplicity.** There being no precepts to remember, and only one subtraction of time to make, anyone with ordinary intelligence may use the method.

(c) **Fool-proof.** Since there are few figures written down, and since all work is shown to scale, errors due to computations are avoided.

(d) **Handiness.** Since plotting is not needed, the equipment is reduced to a watch, a sextant, and a book of curves.

(e) **Tables and Nautical Almanac not needed.** Since only the altitude and GST are needed for getting a fix, the nautical almanac, log tables, and chart are not required.

(f) **Dead Reckoning Position not needed.**



Total equipment required for night work.

22

amateur, or any person for that matter, would come along with a device which would completely or even nearly annihilate static on the longer wave lengths, there would be no question at all but that these veteran long wave transmitters could be used indefinitely.

Experience has shown, however, that atmospheric disturbances are extremely slight on wave lengths below 50 meters; whereas on the longer waves the complete elimination of static has never been attained. Engineers have greatly reduced the effects from static; in fact to such an extent that between Pacific Coast cities it is now little or no obstruction to the high speed handling of traffic. However, at the same time it is also true that if the static could be further reduced, the same transmitter which now operates over a distance of say 500 miles, could be used consistently over distances three or four times as great. As a general rule, power is used to overcome static on the longer wave lengths, whereas this has not yet been shown to be necessary on wave lengths below 50 meters. A small amount of power goes a long way on these very high frequencies.

The Receiving Equipment

Receiving equipment, of course, plays its part in operating through



The San Francisco receiving station of the Makay Radio and Telegraph Company showing rotatable loop antennae.

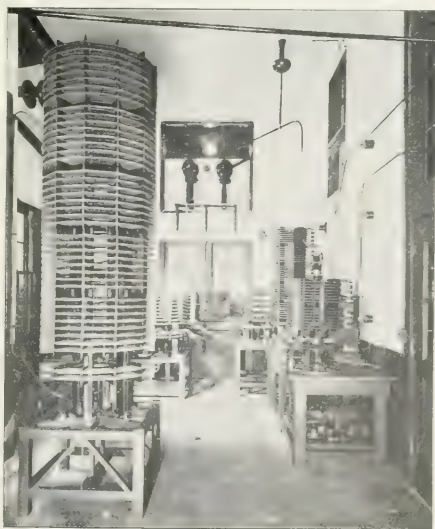
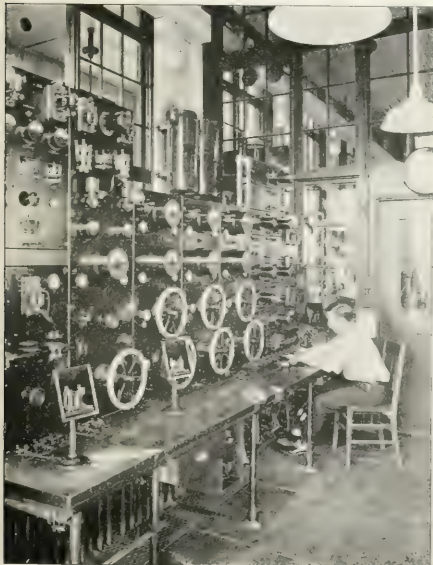
static. Antennas are no longer used in the Mackay Pacific Coast chain, but all receiving is done by means of rotatable loops, which are also directional. This type of receiving loop was first introduced by Dr. Frederick A. Kolster and is now in universal use on radio compasses for direction finding purposes on board ship.

The receiving station, which operates in conjunction with the Marsh transmitting station, is located at Daly City, a suburb of San Francisco. The operating building

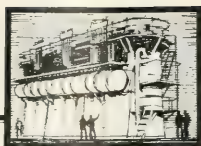
at this station is surrounded by a number of large receiving loops. Each loop is tuned to its given channel and direction. The signals are tuned in and monitored by an engineer attendant and built up to a certain desired strength by means of amplifiers.

Central Operating Room

Both the transmitting and receiving stations are connected to a central operating room in the heart of San Francisco by means of tone channels and control lines. All of the actual sending and re-



At the left, the control room and, above, one of the high frequency rooms of the Mackay station of the Mackay Radio and Telegraph Company.



In the Engine Room

Diesel Engine Cylinder Lubricators

DEFINITE factors underlie the various methods employed for diesel engine cylinder lubrication. The type of cycle and the general design and construction of an engine influence the method of application and the process of distribution of lubricating oil to the cylinder walls.

Economical and efficient cylinder lubrication is accomplished by anticipating and overcoming the following detrimental possibilities, the effects of which are often observed in diesel engine practice:

1. The lubricant may not reach the surfaces requiring lubrication.
2. The lubricant may break down rapidly after having been distributed over the liner walls.
3. The lubricant may have lost much of its lubricating value prior to surfacing the liner walls.
4. The lubricant may be supplied in excess quantity.

The problems involved in these possibilities place heavy responsibilities on the proper selection of a lubricating oil of characteristics essential for correct lubrication and stress the importance of effective methods of applying and distributing the lubricant to the cylinder walls.

In practice a number of methods have been devised to suit the type of cycle and the form of construction of the particular engine. This can best be illustrated by referring to actual schemes employed on the various types of engines.

In the small 4-cycle trunk piston engine illustrated in Fig. 1, a pressure lubricator is shown mounted above the crank case on the fly wheel end. This lubricator is driven by a crank motion actuated from the overhead cam shaft. The crank movement operates measuring plungers which discharge metered quantities of lubricant to fittings on the cylinder walls. Each plunger is connected to a separate fitting. Each main cylinder is provided with two lubricating oil injection feeds. The main pistons

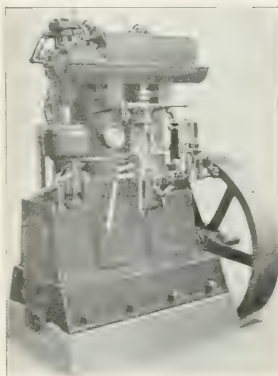


Fig. 1.

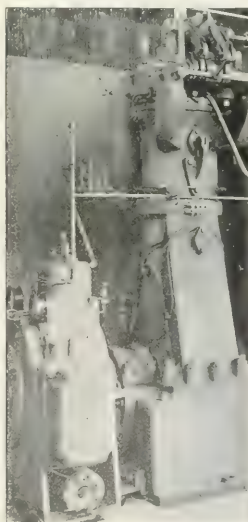


Fig. 2.

are, therefore, lubricated at opposite points. The lubricant is discharged against the piston and piston rings in a solid jet on the discharge stroke of the lubricator pistons. In this engine the lubricating oil injection orifices are always covered by the main pistons so that the pressure at the orifices is never reduced to zero.

In Fig. 2, a lubricating oil pump is attached to the side of each cylinder A-frame. Each pump is actuated by a crank and link driven from the main trunk piston. The pump is fitted with two plungers. One plunger is used for supplying lubricating oil to the wrist pin lubricating tube shown at the waist of the A-frame. The other plunger supplies lubricant to a common manifold shown above the A-frame waist at the extreme right of the illustration. This manifold is provided with four lubricating tubes arranged to distribute the oil at four points of the piston. One check valve is provided at the junction of the manifold and the feed line.

Lubricating oil is measured out by a sight feed drip to a port in the side of the pump. The pump plunger cuts off lubricating oil as it passes the port and discharges a mixture of air and oil to the manifold. An air and oil spray is, therefore, impinging against the piston on its downward stroke with piston timing. The rings are, therefore, covered with lubricant as they pass the lubricator tube orifices on the liner walls. As the engine is a trunk piston engine, the orifices will be covered at all points of the stroke.

In Fig. 3 a large 2-cycle engine is provided with lubricator boxes so that oil is sprayed on the piston rings with positive timing. The lubricator tubes are of the style shown in Fig. 6 and are placed below the exhaust ports in line with the center of the exhaust port bridges. As this is a 2-cycle cross-head engine, the piston is naturally

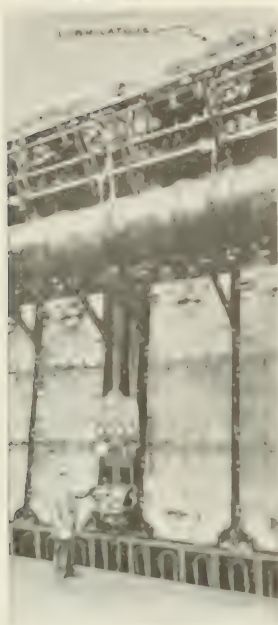


Fig. 3.

provided with a series of rings. The oil rings are provided with a series of grooves which are used to collect the oil from the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall.

A large industrial machine is shown in Fig. 4. This engine is provided with three pressure lubrication boxes arranged about the main shaft. Two of these boxes are for cylinder lubrication and the third for air compressor lubrication. Each main cylinder is provided with two lubricator plungers so that measured amounts of lubricant are introduced at each stroke.



Fig. 4 shows Fig. 6 below.

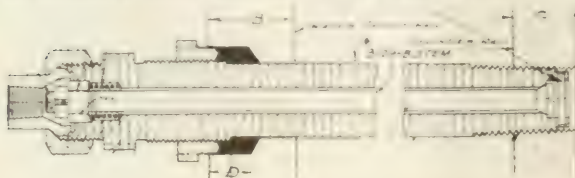


Fig. 5.

The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall.

As the piston rings serve to the upper cylinder, the lubricating tube orifice is still at the top of the ring which carries the lubricant to the upper cylinder. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall. The oil is then carried to the oil rings which are used to lubricate the cylinder wall.

America's Largest Marine Double-Acting, Two-Cycle Diesel

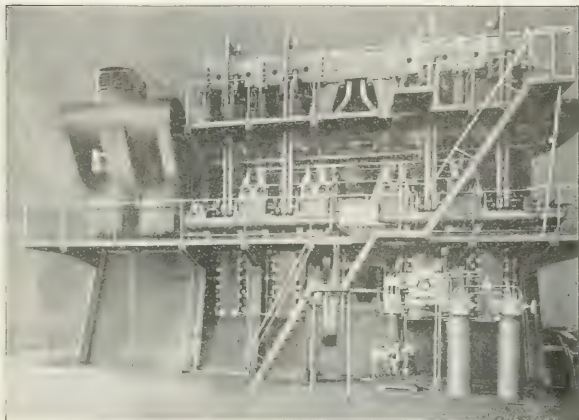
WITH the successful sea trials of the McCormick steamship Wilscox, which were run in lower Boston harbor on April 18, another triumph was scored for the New London Ship & Engine Company of Groton, Connecticut. This company, which started building marine diesel engines in 1910, has made several successful "firsts" in the diesel engine history of the United States, and the marked success of the trials of the Wilscox is in line with previous successes.

In 1912, the first yacht in this country propelled by a diesel engine was equipped by this company, and the yacht is still in active service for an oil company in South America, where it is operating daily.

In 1919, the first diesel-electric drive in this country was installed by this same company in a trawler operating out of Boston, and this installation was successfully operated until destroyed by fire in 1924.

The installation of the engine in the Wilscox shows another pioneer achievement, as it is the largest marine 2-cycle, double-acting engine in this country to date. This engine is a 4-cylinder, double-acting unit of 5000 indicated horsepower and offers an ideal unit for ship propulsion.

The Wilscox, a freight ship of 13,000 tons displacement, 416 feet long, 54 feet beam, and 26 feet 10 3/4 inches draft, was converted for the Shipping Board by the Fore River plant of the Bethlehem Shipbuilding Corp., and the Nelsco en-



Nelsco double-acting, 4-cylinder, 2-cycle, 5000 indicated horsepower unit for the conversion to diesel drive of the steamer Wilscox.

gine was installed at that plant under the supervision of a Nelsco engineer.

On April 12, the engine was given a dock trial at the builder's yard and functioned to the complete satisfaction of the inspectors in charge. On April 18, the official sea trial was run, in the presence of about 100 interested guests, who represented shipping circles and technical institutions throughout the East, as well as representatives of the firms who had furnished engines and auxiliary machinery used throughout the ship,

and all expressed highest approval of the performance of the ship.

The main engine ran without vibration through all ranges of speeds, and on her 6-hour run developed full power at 115 revolutions per minute. There were 46 maneuvers made on going-along-side, using air from only one starting tank, which was not being replenished meanwhile. The ship maintained a speed of 13 knots during her full power run.

It may be recalled that this engine is the one which made the absolutely non-stop, thirty-day run at the New London plant last summer, thereby establishing a world's record.

The New London Ship & Engine Company has been a licensee of the M. A. N. of Augsburg and Nuremberg, Germany, since it started building diesel engines in 1910, and the combined experience of both these firms is responsible for many of the fine achievements and notable improvements in the building of diesel engines in this country and abroad.

The Wilscox has been allocated to the American Republics Line, operated for the Shipping Board by C. H. Sprague & Son of Boston. She will trade between the United States and South America.



United States Shipping Board motorship Wilscox on her trial run.

THE STAFFS of the Environmental Protection and Monitoring Commission are expected to take control of all the marine resources and fisheries resources and the coastal development in the next three to four years. They will also conduct work in the second quarter of the year on the M. 1990-1991 Development

[illegible]

The others were the remnants of an Acorn® balancing machine brought in for this purpose by the Engineering Special Services of Oakland. The complete new year's resolutions came with almost no notice.



†The authors of the Manuscript received the aforementioned and foregoing at the Executive Committee Meeting of the Worcester County Board of Supervisors, May 19, 1906.

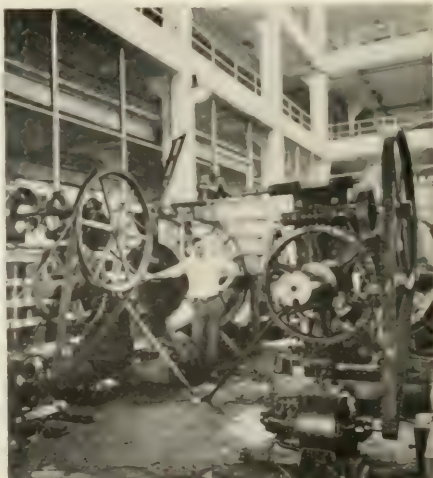
and the World Energy Council. However, the three commentaries are composed of three working papers (1993, 1994, 1995) covering nuclear power and fuel conversion. The second volume is devoted to the assessment of the economic impact of energy policies. The third volume is devoted to the assessment of the environmental impact of energy policies. The fourth volume is devoted to the assessment of the social impact of energy policies. The fifth volume is devoted to the assessment of the health impact of energy policies. The sixth volume is devoted to the assessment of the safety impact of energy policies. The seventh volume is devoted to the assessment of the security impact of energy policies. The eighth volume is devoted to the assessment of the energy impact of energy policies. The ninth volume is devoted to the assessment of the energy impact of energy policies. The tenth volume is devoted to the assessment of the energy impact of energy policies.

A motor with 11 poles, 110 mm diameter and running 3500 rev/min is used to drive the motor.

problem when even slightly out of balance. An unbalanced ounce at the periphery of such a rotor will generate a force tending to unbalance the entire machine by a pull

to static and dynamic balance and with blades of rotor and stator produced

good or better than new and is in condition to give long service with high efficiency and good fuel



At the left view of the Mann's turbines on the shop floor, and, above, a close-up of the boring bar mechanism for aligning the bearings and blading of the stators.



Workboats and Their Power Plants

Pacific Coast Boatyard Notes

Los Angeles Harbor. Eight of the larger Los Angeles harbor district boat-building establishments report a business in new construction of workboats, pleasure boats, and fishing craft during the present fiscal year aggregating upwards of \$2,000,000, and a repair and reconstruction program of over one million. More than half of the new work is for the commercial fisheries. These yards are the Los Angeles Shipbuilding & Drydock Corporation, Fellows and Stewart, Harbor Boat Building Works, Al Larson's Yard, Wilmington Boat Works, Al Brusstar, Fred Ashbridge, and Writing-Meade.

Besides the all-steel, 112-foot \$85,000 fishing boat now nearing completion at the Los Angeles Shipbuilding and Drydock Corp., there are a dozen ranging round 100-foot length and a cost of \$65,000 building in the yards mentioned.

Stephens Brothers, Stockton, are building for the Axelson Bros., Los Angeles, a 55-foot cruiser, of 12½ feet beam and 3½ feet draft. She is to be fitted for 10 guests, having three staterooms, dining saloon, spacious bridge deck and pilot house. All modern improvements will be worked into the vessel to make her comfortable as well as luxurious. Her engines will be two Sterlings, of 150 horsepower each, which will give her a high rate of speed when it is required, with a wide range of cruising at normal rate.

This new cruiser is to be ready for the summer season and will be under the flag of the San Francisco Yacht Club when in commission. Her owners have had several of Stephens Bros. boats and have been very pleased with them, resulting in this latter order.

S. Hyman of San Francisco is



Standard Cruiser by Cryer of Oakland.

also having built by Stephens Brothers a 45-footer to be fitted with two 150-horsepower Scripps engines with a guaranteed speed of 23 knots. This vessel will be fitted with accommodations for seven, with plenty of room. Galley, pilot house control and other improvements, with a very roomy cockpit, will make her comfortable and easily handled.

Building of "cruisettes" is getting to be quite an industry lately. Way up town at 1355 Bush Street, San Francisco, Grant & Grayson are turning out 18- and 20-footers, either with outboard motors or Hallet 4-cylinder engines. Formerly the firm was engaged in building automobile bodies, but now they are entering the marine field with good prospects of success. They are fine mechanics, and their output is in every way up to the mark.

The Elto Motor Shop, under the management of Captain A. T. Peterson, San Francisco, attends to service and repairs of both hulls and engines. They also stock the new "Quad," an Evinrude creation which is said to be somewhat ahead of anything of its type. The Typhoon, which is one of the fastest one step hydroplanes in the world, having a record of 38 miles per hour speed, is driven by one of these motors. A full line of supplies for small craft as well as engines is carried. Business is reported good by the firm, their shop force being steadily employed in installations.



Launch of the tug Chagres at Panama Canal Zone. The Chagres and the Trinidad, whose hull is seen at the left, were built alongside the graving dock and when ready lifted into the water by a floating crane. The two tugs have diesel-electric power plants: Ingersoll-Rand diesels and General-Electric equipment.

booklet on the subject has been issued by the shipbuilding firm and will be supplied to those interested.

Wilmington Boat Works, Inc., specializing in yachts, racing craft, and cruisers, is under the management of Mr. Carlson, well known builder of these types. A feature of this yard is a 60-foot radius power crane which is used instead of ways to handle small craft. The arrangement makes for speed and safety in lifting out vessels needing repairs or painting. The younger son of the manager, "Bobby" Carlson, has designed and is building a unique outboard motor craft; for instead of being "outboard" the Caille engine of 4 horsepower is set amidships, the propeller passing down a well just a few inches abaft of the "step." The stern is also pulled in to a sharp point instead of the conventional beaver tail fashion. "Bobby" believes he will get big speed with this new departure, and the completed hull will weigh but 50 pounds.

Bethlehem Shipbuilding Corporation's San Pedro plant and the Los Angeles Shipbuilding and Drydock Corp. have had a better season on repair work the past winter than in three years previous. The docks and ways have been occupied nearly every day and a good force of men kept busy.

Thomas Broadway's yard, at Newport Beach, California, has on the ways a somewhat unique craft, which will be in service the middle of August. This vessel is 130 feet length by 30 feet 6 inches beam with a draft of 4 feet. She is of the V-bottom type, built for shallow waters. She will have 32 well appointed staterooms, with a large hardwood floored dancing deck, restaurant and observation halls, and will carry 350 passengers besides a large crew. Particular pains have been given to proper distribution of material in her building, and from all appearances she will be a very staunch and able craft. Steel water-tight bulkheads with steel reinforced longitudinals are worked into the structure to insure stiffness for her power, which will be three diesel engines of a total of 450 horsepower. These will be one of Atlas-Imperial build, of 150, and two Bessemers of 150 each, the Atlas driving the center screw, the Bessemers the wing screws. Quite



The cruiser workboat Freedom of Santa Monica, which has recently been converted from gas engine drive by the installation of an Atlas-Imperial 75-horsepower diesel engine.

an ingenious arrangement of the placing of the propellers has been worked out to give flexible handling. Her designer, John Anson, is an Eastern man, as is Mr. Broadway. The new vessel will have a Fairbanks-Morse electric generating set of 37 kilowatts at 110 volts to handle the lighting and furnish power for auxiliaries, which will include a septic tank pump and an Allan Cunningham windlass, besides the regular bilge and fire pumps.

The Pocomoke, a former steam driven fishing vessel, had her steam plant replaced by a 150-horsepower, Fairbanks-Morse, directly reversible diesel at this yard. The Pocomoke is 120 feet length, 20 feet beam, and 7 feet draft, and with her new engine develops good speed at a most material reduction of operating expense.

Broadway's yard has a fine run of repair work and, being fully equipped with modern machinery, is able to handle jobs in a workmanlike manner with good dispatch.

A. E. Hansen's yard at Newport Beach, while a one-man establishment, has turned out 24 cruisers and small fishing craft during the past three years. Among the latest is a 40-foot cruiser for E. E. Converse of Santa Paula. This craft is fitted with a Cummins 40-horsepower diesel engine and is a very neatly arranged and comfortable boat. A special feature of this little ship is that she will be operated in the winter months out of Newport along the coast and in summer taken up to Sacramento where she will be lifted onto a flat car and transported to Lake Tahoe for the season. Her owner, a wealthy fruit grower of Santa Paula, believes in having an all the year round yacht, able to go either on the ocean or inland waters. In addition to every convenience she will be fitted with a carbon dioxide fire extinguishing equipment supplied by the Marine Engineering and Supply Co., of Wilmington.

Appointments to the Shipping Board

President Coolidge, coincident with the signing of the Merchant Marine Act of 1928, has appointed two commissioners on the United States Shipping Board, Captain Samuel S. Sandberg of California to take the place of Philip S. Teller, resigned, and Hutch I. Cone of Florida to succeed Admiral Benson, whose term expires in June.

Sandberg has been traffic manager of the harbor of Los Angeles for some years. For twenty years he was a leading transpacific ship master with the old Pacific Mail, commanding the China, the Siberia

and the Korea. He served his time on American sailing ships.

Hutch I. Cone retired from the Navy with the rank of rear-admiral in 1922 to assume the duties of vice-president and general manager of the Emergency Fleet Corporation, from which he resigned in October 1925. Prior to his duties as commander of naval aviation forces during the war, he had been marine superintendent of the Panama Canal.

Both of these men are active proponents of a privately owned American merchant marine.

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In addition to the successful navigation of the *Albatross* by Capt. John A. King, the trip was made between San Francisco and Sacramento, Calif., by the *Golden Gate* by Mary, named after his wife, and the other the Young America, a reproduction of the famous picture of the Sacramento waterfront during the early days.

In looking over old publications in the State Library at Sacramento it was found that opposition was the rage in the first running of steamers on the river. Fares were



Cynodon Willdenow. *Pennisetum* Trinell; grasses abundant
throughout all the Savannah lands and culture at the
Washington Station at Pacific Marine Reserve.

a trip, and fifty cents did not cover the cost of the fare home. The Central American Transportation Company and the late Captain Taylor were partners in the business then. Captain Taylor, finding a more permanent in Gordon Bradley, withdrew his share from the partnership, and Bradley determined to run his own line. Later he met with reverses and was put out of business.

He is going to the Fraser River, British Columbia, to survey that waterway regarding its feasibility for navigation.

in the morning there being no. The Indians were bad then and kept me prisoner some while in a huff, all these things were in the stomach, and then they put in the spirit house.

To Miss Rachel Gurnett, at the same library at Hingham, are due the minutes of the first Marine School for you will be providing some recording the early activities in the conduct of this sketch.

NOT only has the United States led manufacturing in the way of innovation, the University of Illinois has led in research. This year of 1977-78 was marked by the University of Illinois Department of the Physical, Earth and Space Sciences and the Center for the Study of the Atmosphere and Space, which has been the focus of the research, that has led to the discovery of the ozone hole over the year that ended December 31, 1977.

It is interpreted that only those cases which are judged to be the least in percentage of cases are in the United States, and the opposite is true for the rest of the world.

Sardines, as usual, lead in the fish market with a percentage of 42.75, followed by mackerel with 31.25.

San Francisco County leads the state in 1990 population with a total of 180,773,418 residents. Los Angeles County is second with 100,000,000 residents. San Francisco-San Mateo Counties third with 37,616,402.

During the year 6,511,929 pounds of salmon was caught; 6,369,323 pounds of rockfish; 4,728,303 pounds of herring; 4,125,722 pounds of halibut; 4,055,704 pounds barracuda; 5,803,649 pounds of salmon; 5,577,800 pounds of halibut; 1,168,321 pounds of herring; 4,898,386 pounds of blue fin tuna; 1,225,456 pounds of yellow perch; 1,225,456 pounds of yellow perch; 1,225,456 pounds, while 1,986,295 pounds of

In addition to the California catch, records of fishermen and packers show that 62,132,490 pounds of fish was brought in from Mexico and extra territorial waters off the coast of Mexico during the year by California fishermen. The largest item in this list was 28,003,362 pounds of skipjack. Barracuda totaled 1,844,156 pounds, and 1,466,848 pounds of white sea bream came in from waters south of the California-Mexican boundary.



Young Americans of the 1980s

An All-Welded Motor Tanker

THE increased recognition and use accorded welding by the shipbuilding industry and the marine world in general is illustrated in the construction by the S.O.S. Welding Corporation, Brooklyn, of a 102-foot over-all tank barge for Canadian interests. The framing and plating of this vessel are electrically welded throughout. The frame design is based on the "trussweld" system, which is an innovation in shipbuilding and the invention of J. Kjekstad, chief engineer of the corporation. The plans were drawn by Captain C. S. Hawkins, well-known naval architect, and the owner's representative.

The vessel structure is similar in numerous ways to that of a number of large all-welded steel tanks recently constructed by the same company, for a large American oil corporation. The construction methods employed in the building of these tanks were modified and developed into the design and construction of this modern diesel-propelled tank barge.

The entire method of construction has been approved by the American Bureau of Shipping, and the vessel receives the classification A1. In strength the structure far exceeds official requirements.

The tanks of this barge will withstand a hydrostatic test pressure of about 10 pounds per square inch, and the deck strength, if required for the carrying of a cargo, is such as to exceed the carrying capacity of the vessel. The shell of the barge possesses extraordinary local strength, by reason of the system of internal bracing.

With this new type of bracing the carrying capacity per square foot of deck loading area is far in excess of that obtained from use of the old method. The all-welded hull construction also permits carrying a liquid cargo in the hold in addition to a deck load. All seams have joint efficiency of 100 per cent and are permanently tight. Another outstanding feature of this system is its ability to withstand



All-welded steel motor tanker, built for Canadian interests by the S.O.S. Welding Corporation, Brooklyn.

both internal and external pressure far in excess of allowable stresses when usual methods of construction are employed. Many problems peculiar to electric welding as applied to hull construction that have arisen during construction have all been happily solved and the experience gained will undoubtedly prove of inestimable value in future construction work.

Several new features in hull construction are incorporated in the new craft. For example, there are only six steel plates forming the entire side shell of the vessel. Both starboard and port sides from the stem to points twenty-five feet aft consist of single plates with no breaks, courses, or seams of any kind. In fact, there are only two vertical seams on either side of the vessel from stem to stern transom.

The barge is 102 feet over-all, 20 foot beam, and 8 foot depth, with a carrying capacity of about 65,000 gallons of liquid cargo, on the desired draft of 6 feet 6 inches. The vessel is arranged in the forepeak compartments for dry storage, with two cargo tanks on each of starboard and port sides. The rotary cargo pump is located in the cofferdam, next aft, on either side are

arranged two cargo lubricating oil tanks and next aft two fuel storage tanks. These spaces segregate the motor room from the gasoline cargo spaces. Next in the wings are located dry storage spaces and at the stern the afterpeak tank for the fresh water supply.

There is a steel house on deck containing pilot house and sleeping accommodations. The trunk house over the motor room aft forms a galley and messroom.

Complete 4-inch welded cargo suction lines are installed with all tanks separately controlled by branch valves from the deck. The cargo pump is operated by a 10-horsepower vertical gasoline engine located in the motor room. The driving shaft extends through the bulkhead into pump room. The main motor is an Atlas - Imperial diesel of 125 horsepower, with bronze shaft and wheel, the outboard bearing being carried on a cast steel strut. The usual auxiliary electric light, air compressor, and bilge pumping unit is located in the motor room. Hand steering is arranged to operate twin rudders yoked together for synchronous operation, with leads along the deck. Electric wiring is all in conduit, and the installed fixtures include navigation and searchlights.

The entire engine room and galley aft of the cofferdam contain no inflammable material whatsoever. All equipment, including stools, kitchen cabinet, dishes, is made of steel or similar material, which is a very important feature from the underwriter's viewpoint.

The rapid construction possible under the Kjekstad Trussweld System is apparent from the fact that for the first time a self-propelled oil barge was constructed and launched complete in approximately 60 days.

This electric welded method of construction is now being adapted to other designs for marine purposes, according to Captain Hawkins. Included in these designs are dredge hulls, carfloats, deck scows, pile-driver hulls, and fuel barges, all of which may carry part liquid and part deck cargoes, as may be desired. Vessels of this type can be constructed at much less expense than can riveted framed types of steel vessels.

Captain Hawkins is firmly convinced after many years experience

The design of the construction of the hulls of the boats, built from 100 to 150 feet long, is such that it is possible to launch them from small built-up ramps for inland waterways and for harbor entries of all kinds and to use them in shallow water with shallow hulls of the same dimensions. It is possible that with the introduction of the new hulls of the boats, the field of inland waterways will be greatly extended.

The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago. The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago. The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago.

Starters, which are designed for use with alternating current motors.

The Invincible Nozzle. A catalog of fire department supplies and diving apparatus has been issued by Andrew J. Morse & Son, Inc., 221 High Street, Boston, Massachusetts. This book was first published in 1920 and is now in its fourth edition. It is a complete and up-to-date catalog of fire department supplies and diving apparatus.

The catalog is full of valuable data regarding the latest equipment for all types of fire-fighting apparatus and should be on the desk of every engineer, port superintendent, wharfinger, shipbuilder, and contractor.

The International Nickel Company. 67 Wall Street, New York, has issued in leaflet form "A brief presentation of the improved characteristics of Nickel Iron Castings covering (1) improved machinability, (2) uniform structure, (3) increased strength, and (4) increased hardness."

Port of Seattle Yearbook, 1928. As usual, the annual report of The Port of Seattle has been issued in book form, beautifully printed and illustrated. In addition to the usual matter which are a necessary feature of all annual reports, this book is used as a medium to present to the world the many industries, agricultural, and other enterprises that go to make up the wealth of this port and to supply cargoes for its ships. All of the various advantages of wharf and harbor are well illustrated and some idea of the beauty of scenery and the variety of occupation and recreation possible in the Puget Sound area.

That Haunting Charm is the title of a booklet on Hawaii recently sent out by the Los Angeles Steamship Company. The book is a work of art and is designed to attract tourists to the "land of enthralling beauty and colorful adventure" via the palatial liners of the Los Angeles Steamship Company. The booklet is obtainable from any of the branch offices of the line or from the main office at 730 South Broadway, Los Angeles.

Trade Literature

McIntosh & Seymour Diesel Engines for Dredges. The Bulletin 98 recently issued by the McIntosh & Seymour Corporation of Auburn, New York.

This is a very interesting booklet of 20 pages in which this large builder of diesel engines for marine, rail, and stationary purposes relates the superiority of the McIntosh & Seymour four-stroke-cycle diesel engine for efficient and economical dredge power. A number of representative dredging units are illustrated and fully described as to power plant and equipment, with tables showing their actual operating results. Among these are the dredges Clackamas, A. Mackenzie, W. L. Marshall, Raymond. The booklet is profusely illustrated with photographs, line drawings, and tables.

Elwell-Parker Tractors. Catalog No. 150 issued recently by the Elwell-Parker Electric Company of Cleveland is a beautifully printed and illustrated catalog of the materials handling equipment manufactured by this company. The booklet has thirty-seven pages and is printed on very fine coated stock. It is divided into departments covering the following equipment: General construction features and cost data on the Elwell-Parker products; self-loading lift tractors; elevator tractors; cranes; platform tractors; tractors; tiering tractors, and a page of illustration of special tractors built for standardized units.

Worthington Pump and Machinery Corporation, 115 Broadway, New York, has ready for distribution two new booklets, No. S-172 on Vertical Four-Cycle Air Injection Diesel Engines and No. S-173 on The Worthington Double-Acting Two-Cycle Diesel Engine.

The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago. The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago. The new hulls, which in 1934 were in service, are being used in marine circles, was for ten years ago.

Illinois Steam Specialties. This is the title of various bulletins by the Illinois Engineering Company of Chicago.

We believe the following would be of interest to our readers: Bulletin No. 14 describing its line of thermo-modulating traps and re-circulating pumps; Bulletin No. 20 describing its line of vacuum pump governors, blast traps, and steam and strainers; Bulletin No. 21 describing its line of steam traps; Bulletin No. 45 describing non-return and nonchattering steam valves, both globe and angle; No. 53 describing separators fitted for any use; No. 103, covering pressure reducing valves for all kinds of liquids and gases; No. 203 covering back pressure and relief valves.

Any of these bulletins may be obtained from the main office at Chicago or from James I. Krueger, Sales Representative at 417 Market Street, San Francisco.

Speeding Up Production with Automatic Control. This is a 20-page booklet (Bulletin No. 110) issued by the Monitor Controller Company of Baltimore, Maryland. It is graphically illustrated and should be of interest to shipbuilders and other production units where the necessity is felt for further mechanical equipment to offset the high cost of manual labor.

This firm has also issued bulletin No. 112 covering Thermaload



Auxiliaries•Ship Supplies•Marine Equipment

John Crane Condenser Packing Methods

CONDENSER packing is one of the important factors in the economical use of steam in prime movers. If, in a large condenser, the hundreds of tube ends are all tight in the sheets and are all functioning 100 per cent for the unobstructed flow of cooling water, then the air pump, and the circulating pump, and the prime mover, and the steam generator, and the chief engineer are all serenely happy and efficient. If the reverse condition obtains in the condenser, then all down the line the entire power plant is apt to be working at cross purposes. This contrast is particularly applicable when the plant is afloat on salt water and is using that medium as a cooling agent.

The Crane Packing Company, fully realizing these conditions, set itself to design a condenser tube packing that would serve the following purposes:

- (a) To give leak-proof tubes;
- (b) To be permanent and non-deteriorating;
- (c) To give a metallic bond and thus prevent deterioration by electrolysis.

John Crane metallic packing is the result, and this excellent product is further improved by the method of applying it to condenser tubes without the use of ferrules. For this purpose The Crane Packing Company manufactures tools especially designed to fit various sizes of condenser tubing and furnishes complete instructions for the work. The latest improvement is the new method of securing the tube at the inlet end and packing with John Crane metallic at the outlet end.

Advantages connected with any method of former joints naturally group themselves under these three headings:

- (1) Economy of installation;
- (2) Mechanics of operation;
- (3) Theoretical improvement.

Graham Smith, West Coast branch manager of the Crane Pack-

ing Company, lists the advantages of this new method of packing tubes on surface condensers under these three headings as follows:

Economical

It is installed in half the time of corset lace.

Saves cost of all ferrules.

Saves labor of installing ferrules.

Total cost less than one-half corset lace job and approximately one-half of fiber bushing job.

Mechanical

Avoids liability of cross-threading ferrules, stripping threads, breaking web between drillings, leakage from tight eccentric ferrules, danger of bottle-necking tube with ferrules.

Inflow end of tube is rigid. Outflow end of tube is free to expand and contract. Frictional resistance very much lower than that of any other method of packing used.

Avoids the danger of crystallization of tube or stretching of tube sheet, as sometimes occurs when tube is rolled.

Bond will not break down and leak from vibration and will tighten with moisture, not requiring any rerolling.

On old condensers where threads

are stripped and the web between drilling has broken, this method will save the cost of new tube sheets and still give all the advantage of rolled tubes on inflow end.

Theoretical

Both ends of tube are bonded to tube sheet reducing liability of electrolytic action. Hydraulic efficiency of condenser improved as entrance orifice is same area as tube area and velocity is not increased. Also any trash that can enter tube will pass through and out of same.

Both ends of tube are flush with surface of sheet avoiding turbulence and the resulting aeration of circulating water.

The inflow end of tube being belled reduces the liability of turbulence, cavitation, and erosion.

The operation of the belling of the tube burnishes inflow end, giving this surface greater resistance to erosion or mechanical abrasion than that of the rest of the tube.

Summarizing

This method is (first) the least expensive, (second) the nearest to mechanical perfection, (third) offers more theoretical advantages than any method in use at this time.

The Binks 105 Paint Gun

THE application of paint by hand brushing is today almost a thing of the past. High labor costs made it imperative that quicker ways of painting be devised. Spraying by compressed air was introduced and many devices have been manufactured and placed on the market for the purpose.

Much progress has been made along the lines of bettering the machines, especially in those parts which break up or atomize the paint, and it is claimed that the Binks 105 Gun is about as near perfection as it is possible to be. Simple, yet sturdy, it will stand hard usage and is easily cleaned if by any means it should clog, which is

a remote contingency. All kinds of paints and enamels can be spread with this gun, which, in addition to being highly efficient, is light and easily handled without tiring the operator.

This system of spraying paint could be well adopted for marine use and would be of great advantage over the old style of painting. The problem of today among ship operators is to keep their vessels moving. Short lay days in port and rapid driving at sea are against the old slow hand painting, but with the modern methods time can be saved and better work done. These paint guns are now so well developed that they can be used on inside

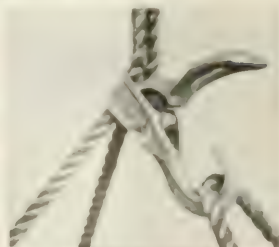
work as well as any in the world. The fact that it is made in the United States is a point in its favor.

To test the strength of the rope, the following test was made: A rope was pulled with a force of 100 pounds.

It was found that the rope was strong enough to hold a weight of 100 pounds. The rope was also found to be strong enough to hold a weight of 100 pounds.

Improved Rope Sling

THE following is a description of a rope sling with a draft in the best position for lifting a load. The rope is made of the best quality of rope. The rope is made of the best quality of rope. The rope is made of the best quality of rope.



The rope sling.

When the rope is in the best position, and after landing, automatically holds the sling in that position until released by pressure on the rope. The rope is made of the best quality of rope. The rope is made of the best quality of rope.

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Beacon Lights for Aviation

THE Sperry Corporation of Brooklyn, which has given great assistance to the perfection of navigation afloat, is now helping largely in the solution of the problem of navigation of aviators, through the perfection of its searchlight apparatus and the installation of beacon lights. One of the recent instances of the use of this apparatus for providing guides for night flying is the installation of the searchlight Sperry beacon lights on the Terminal Building at Cleveland. This installation is now being placed in regular service. The lights are of the incandescent type and are mounted on the forty-ninth floor of the new building which is located on the Public Square adjoining the Cleveland Hotel.

Each of the beacons, which were designed and built especially for the Terminal Building Company, consumes 2 horsepower of electrical energy at 32 volts. A special motor generator for converting the building supply current to the required voltage is installed on the same floor as the beacons. The

switchboard and other control apparatus are located in the basement. The beacon is 10 feet in diameter and carries a 100-watt lamp. The length carries the electrical power for these lights up from the main control-room in the basement.

In order to insure continuous operation during the "on" hours of these lights, each is provided with a lamp changer which automatically places a fresh lamp into the burning position when one burns out. A small "sentinel" or robot stands near the burning lamp and supervises the burning of his charge. It takes no notice whatever of the normal turning on and off of his charge, but just the instant a lamp goes out when it shouldn't he starts the machinery which places a fresh lamp into position and turns the current onto it. The reflecting mirrors are 24 inches in diameter and are optically ground glass of a special character.

The forty-ninth floor of the Terminal Building is hexagonal in shape and each side is fitted with a casement window through which will project the powerful beams

from these lights. It is expected that this arrangement will give an unusual brightness and because of the different angles through which the light is thrown, making that way at night.

In a light-colored rope, the light will be visible from the air under favorable conditions. The rope is made of the best quality of rope. The rope is made of the best quality of rope.

Sea-Ro Packing

A NEW plastic metallic rod packing is being introduced by the Sea-Ro Packing Company. This packing is made of a plastic material which is strong and durable. It is made of a plastic material which is strong and durable. It is made of a plastic material which is strong and durable.

The Sea-Ro Packing Company is a new company which is known among the marine men of the Pacific, who will make his headquarters at the Hotel de Ville. The Sea-Ro Packing Company is a new company which is known among the marine men of the Pacific, who will make his headquarters at the Hotel de Ville.

Besides the long service given by the Sea-Ro in steam rod packing it is well adapted for all sorts of liquids, particularly gasoline, ammonia, or any of the oils.

The same manufacturers make a piston ring for pumps that has commendable features. The metal used in these rings is claimed to be superior to anything now in use, and they have a patented feature in being so made that they can be cut like a steam piston ring, an expansive spring built into the ring making it resilient, insuring tight pistons with a minimum of friction. It may be mentioned that the Sea-Ro packing and rings were invented by a marine engineer who understood marine service needs.

TRADE NOTE

Joseph S. Jones, vice-president of, and for ten years associated with, Charles Cory & Son, Inc., manufacturers of marine equipment, has resigned.

Johns-Manville Plant Expansion

Pacific Coast Factories at Pittsburg, California, Greatly Enlarged

CONTRACTS have recently been let for the structural steel for a wharf 600 feet long, with a warehouse and two additional manufacturing units at the Pittsburg, California, plant of the Johns-Manville Corporation. The construction of this wharf places the factory in a position to ship or receive deep water cargoes at a point where the other side of their factory abuts on transcontinental rail lines.

The new plant will include a paper mill and a roofing unit, which will be in operation about July 1. When completed, these additional facilities will enable the Johns-Manville Corporation to manufacture at Pittsburg, California, asbestos paper and board, asbestos roofings, asphalt prepared roofings, slate surfaced shingles, deadening felts, roofing cements and coatings, brake band linings and packings, and practically all the other specialties which this company markets on the Pacific Coast. The capacity of the present boiler plant at Pittsburg will be doubled and the new equipment installed will be of the most modern design and will constitute a complete paper mill, roofing plant, and asphalt refinery.

Since January, 1926, when the present original factory consisting of two units was put in operation, Johns-Manville Corporation has been manufacturing its Pacific Coast needs in rigid asbestos shingles, steam and cold insulation materials, and insulating and refractory cements.

This company has found Pittsburg ideally situated for a plant of this kind. It is less than fifty miles from either San Francisco, Oakland, Sacramento, or Stockton, the principal distributing points for northern California. It is served by three transcontinental rail lines and is situated on deep water on Suisun Bay, an arm of San Francisco Bay. Developments now under way will permit direct calls of the largest ocean-going freight vessels, assuring prompt deliveries to all Pacific Coast ports and the Far East. The location at this point of other large industries and the mild and healthful climate and comfortable housing conditions insure satisfactory labor turn-over.

This new addition to an already fine plant represents another chapter in western development and in

the progress of the Johns-Manville Corporation in the Pacific Coast manufacturing fraternity.

The New FG Maxim Silencer

A new model Maxim Silencer, known as the Model FG, has been announced by the Maxim Silencer engineers. This new type is for use on 4-cycle diesel and gasoline exhausts.

For many months, Maxim engineers have been developing this new, compact silencing unit with the result that the FG unit is smaller, lighter, and less in cost than previous types used for 4-cycle engines. It is applicable to both stationary and marine installation, and in the marine work the reduced size and weight are regarded as being of great importance.

The FG Silencer works as well as, if not better than, the previous models used for this work. It has been thoroughly tested and proved entirely satisfactory. Specifically, its advantages are:

1. It is smaller and lighter than any device proposed for quieting exhausts from 4-cycle engines.

2. It transmits no noise through

the shell (shell noise is distinct from exhaust noise).

3. It will give practically complete elimination of the exhaust noise, being equal or superior to the Maxim Silencer previously used for such work.

4. Being much smaller and lighter than previous models, it is easier to install.

5. It imposes negligible backpressure.

6. The entire silencing unit can be withdrawn with the inlet head and then easily cleaned, part by part. With proper operations, however, 4-cycle diesel engines should not be particularly dirty.

7. The FG Silencer is less expensive than the previous Maxim Silencer.

The FG Maxim Silencer is available for any size 4-cycle engine, and can be installed vertically or horizontally. It is built by the Maxim Silencer Company, Hartford, Connecticut.

Ellis System Advantages Demonstrated

THE construction advantages of the Ellis Channel System of Steel Hull Construction were demonstrated in the recent barge built for New York & Hastings Steamboat Company (Anaconda Copper Mining Company, subsidiary) by the Midland Barge Company, Pennsylvania, a subsidiary of The Treadwell Company, New York.

The barge measures 115 by 34 by 10 feet. All the steel material for this vessel was fabricated at Midland, in the shops of the Midland Barge Company, riveted up in large sections and shipped to the Smith & Williams Company, Salisbury, Maryland, where it was erected and completed by the Midland Barge Company's representative in a remarkably short time, with all of the transverse frames being erected in one day. The wood deck and cabin work was done at the Smith & Williams a capacity of 900 tons, and will

liams Company plant. This vessel be used for carrying pig copper and lead from Hastings-on-Hudson, New York, to Perth Amboy.

The accuracy of the work done by the Midland Barge Company in fabricating these frames was remarkable, not a hole had to be reamed.

Gyro for New Tanker

SOON after the motorship C. O. Stillman, recently completed in Germany for the International Petroleum Company, dropped anchor in New York Harbor on her maiden voyage, a Sperry Gyro-compass was hoisted aboard from a tender. The Sperry Gyrocompass Co. reports that in addition to the C. O. Stillman, the Conte Grande and many vessels now nearing completion in European yards are to have Sperry gyro-compasses installed.

New Pipe Mills of Bethlehem Steel Company

BETHLEHEM STEEL COMPANY is now operating all of the units of its new pipe mills at the Maryland Steel Company Plant, Maryland. These units, two mill units designed for the production of 100,000 tons of pipe a year, will produce 100,000 tons of pipe a year. The new pipe mills will manufacture all sizes of lap-welded pipe from 4 to 16 inches in diameter in galvanized, black, and all different requirements. Operating with large equipment, including three mill units, manufacturing of pipe is now being pushed. From the start of the plant and now going through important stages.

1. From the receipt of the order to the delivery of the finished pipe, insuring the turning out of a uniform product of the highest grade.

2. Through the transportation facilities. These units are available to the largest coast-going vessels, port of call, and from ship to water to all intercoastal points as well as European and other foreign ports. Three trunk line railroads, the Pennsylvania, Baltimore and Ohio, and the Western Maryland, give adequate service for rail shipments.

3. About 100,000 tons of pipe



The new pipe mill at Sparrows Point.

4. The thoroughness of the inspection of the pipe, from the start of the process to the final product, and the production of a uniform product of the highest grade.

5. The thoroughness of the inspection of the pipe, from the start of the process to the final product, and the production of a uniform product of the highest grade.



Interior of the pipe warehouse at Sparrows Point.

Trade Literature

Cox & Stevens, Inc., naval architects and engineers of New York, have recently prepared a booklet for the use of Diesel Engines for Yachts for the information of those interested in the use of diesel engines. A number of yachts designed by this firm are illustrated.

"The Job Specification," the first of a series of Handy Manuals of Standard Employment Practice just released by the Policyholders Service Bureau of the Metropolitan Life Insurance Company.

This booklet is designed to show the advantages to the employer and employee of knowledge of physical requirements, actual duty, amount of training necessary, standards of performance, methods of payment, and other relevant elements of any given job.

Merchant Marine Statistics, 1927. 75 pages. Lists of American documented vessels, showing tonnage, customs district and port in which registered, number built in United States, and number of foreign built admitted to American registry. Included are tables showing tonnage taxes collected, number and nationality of seamen on American vessels, and average monthly wages paid. There is also a table giving tonnage of vessels of different countries of the world. Obtainable from the Superintendent of Documents, Government Printing Office, Washington; price, 15 cents.

New Diesel-Electric Stern-Wheel Towboat

A NEW diesel-electric towboat, the Tecumseh, the fourth of its kind to be built and the second of its kind to be equipped with diesel-electric propulsion, is shortly to be put in service in the St. Louis district by the U. S. Engineering Corps. The boat was given dock and river trials recently in the Kanawha River at Charleston, West Virginia, and the final completing details are being added by the builders, the Charles Ward Engineering Works of Charleston.

The new boat is completely electrified by the General Electric Company, the equipment involving a number of novel design features. The power plant consists of a 300-horsepower Lombard diesel engine driving a 210-kilowatt, 400-r.p.m., 190/315-volt generator and a 20-kilowatt, 400-r.p.m., 120-volt, compound-wound generator. The larger generator will supply power to two 115-horsepower, 360/600-r.p.m., shunt-wound propulsion motors, and the smaller generator will supply power for running auxiliaries and for lighting, as well as excitation for the main generator and propelling motors. The paddle-wheel, located at the stern, is driven through two sets of Link-Belt chains.

The speed of the boat is controlled by a unique method, considered a decided improvement in diesel-electric drive for towboats. The propulsion machinery is so designed that the motors run at all times (except during maneuvering) at speeds suitable to take exactly full-load power from the prime mover. As a result, maximum over-all speed and highest efficiency are automatically obtained at all times. In normal operation, the pilot house operator sets the control handle at either the "Full Ahead" or "Full Astern" position, and the speed control thereafter is automatic. Should the pilot desire slower speeds than those automatically provided, these can be easily selected.

Control of the propulsion equipment is of the variable voltage type, the main control panel, auxiliary switchboard, and controlling rheostat being located in the engine room. There are two control stations, one in the pilot house and one in the engine room, allowing control of the boat from either point. Indication is provided in the pilot house to show at all times

the paddle wheel speed and the main generator output.

All the auxiliaries on the boat are electrically driven.

H. F. Alexander Philco Equipped

THE "greyhound of the Pacific," as the steamship H. F. Alexander is known as one of the many vessels that have Philco batteries as part of their regular equipment.

It is not generally known to the layman that storage batteries are very essential to the safety and efficiency of operation of all steamships, particularly the large passenger vessels. In the case of the H. F. Alexander there is a battery for the wireless, another for the telephone system, and a third for emergency lighting. All these batteries are Philcos. They are a special heavy duty type capable of carrying a heavy load over long periods and are built to give long life with the minimum of attention.

When the H. F. Alexander put to sea on the first voyage of the 1928 summer season, she carried a new Philco battery for emergency lighting consisting of 52 cells. This was installed early in May and replaced a battery, also Philco, that had given over six years of uninterrupted performance in this important service. That the owners appreciate the dependableness and efficiency of Philco batteries is evidenced by the fact that they again or-

dered Philcos. They knew they were taking no chances, and this is the great importance where the convenience and comfort of their passengers are concerned. Philco batteries are made in many different sizes and types for all kinds of service. They are made by a company that has built its reputation on the quality of its products and the integrity of its policies.

Hill, Hubbell & Company Expands

To provide larger and more efficient quarters at the Los Angeles Sales Offices of Hill, Hubbell & Company, Pacific Coast Paint Manufacturers will be moved on June 1st, from 331 West 11th Street, to the Petroleum Securities Building 714 West 10th Street. This news follows closely on the announcement, made at the first of the year, when the San Francisco offices of Hill, Hubbell & Company were moved to new and larger quarters at 160 Fremont Street. This company maintains sales offices and warehouses in principal Pacific Coast cities. They are located at Los Angeles, San Francisco, Oakland, Portland, and Seattle. The mid-continental offices and factories are located at Tulsa, Oklahoma, and district offices and warehouses are also maintained at Houston, Texas, Baltimore and New York.

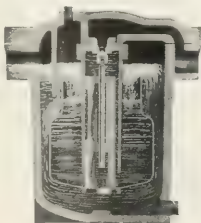
The Eclipse Trap

IN the May issue of Pacific Marine Review, on Page 224, there appeared a description of the Eclipse steam trap, an enumeration of its advantages, and an illustration showing a cross-section of the mechanism. The Eclipse trap is a very fine trap; it works with certainty and precision; but being dependent for its action, at least part-

ly, on the force of gravity, it will not work upside down, as it appears in page 224 above mentioned. We therefore now take the opportunity of apologizing to the Eclipse trap, its manufacturer, and its agents, and herewith reprint the illustration with the trap in its proper position.

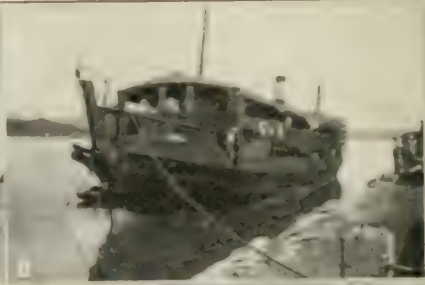
This trap possesses great capacity in compact form; freedom from wire drawing; instant valve action; freedom from air binding; movement of valve stem independent of bucket; monel metal valves and seats; and accessibility.

Eclipse traps are manufactured by the Illinois Engineering Company of Chicago, which is represented in San Francisco by James I. Krueger. C. V. Lane handles marine sales in the San Francisco Bay district.



The Eclipse Trap

Fairbanks-Morse Diesels Round the World



A. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

B. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

C. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

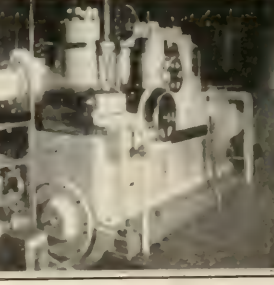
D. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

E. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

F. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

G. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.

H. The Yamacraw, heading for Yamacraw, and the Fairbanks-Morse Diesel ship, heading for Yamacraw, during the Yamacraw.





Marine Insurance

Edited by JAMES A. QUINBY

Court Allows Stockholders in Vessel to Limit Liability

EVER since Congress, in its infinite wisdom, saw fit to allow vessel owners the right to limit liability, the ship-owning fraternity has enjoyed a certain degree of immunity denied to ordinary critters. If I take my flivver and demolish a jewelry store, the storekeeper may proceed to law and eventually recover the full amount of his damages, provided my worldly goods are sufficient to cover the loss. On the bounding billows, however, my seagoing flivver can proceed to sink the Malolo, and if I am free from personal fault, I can wave an airy hand and say "Take the flivver, boys"—and that's the end of it.

Vessels may be owned in various ways, as by individuals, partnerships, or corporations. In case of corporate ownership, it has always been tacitly understood that the stockholders of the corporation had the same right to have their title protected by limitation as any other owners or quasi-owners.

California Stockholders' Status

Under Article XII. of the California Constitution it is provided that each stockholder of a corporation is "individually and personally liable for such proportion of all its debts and liabilities, contracted or incurred during the time he was a stockholder, as the amount of stock or shares owned by him bears to the whole of the subscribed capital stock or shares of the corporation."

On March 9, 1923, one Andrew Flink, claiming that he was injured on board the tug Henrietta owned by the Paladini corporation, brought suit against the owners of the vessel and against the stockholders of the corporation. The vessel owners and stockholders, represented by the admiralty law firm of Ira S. Lillick, immediately filed a petition to limit their liability to the value of the tug. As an incident of such action, an order was issued by the Federal District Court, restraining the further prosecution of law actions brought by Flink.

Flink, by his attorneys, Ford, Johnson & Bourquin, then made a motion to vacate the restraining order as regards the stockholders, on the ground that limitation of liability is a privilege granted to vessel owners, and stockholders, though they labored under direct liability by virtue of the California law, were not "owners."

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And tell a friend to tell it on the Street.

J. A. Q

Stockholders Discriminated Against

If the vacation of the restraining order was correct, a partnership or individual owner might benefit by the limitation statute, but stockholders could not.

The case was immediately appealed to the Circuit Court of Appeals for the Ninth Circuit. Numerous amici curiae filed briefs in support of the stockholders, and insurers and shipowners waited breathlessly for the decision of Judges Gilbert, Rudkin, and Die-

trich, which was handed down on April 30 last, reversing the original order, and granting stockholders the same rights as other owners.

The opinion reads in part as follows:

The principal provisions of the Federal Statutes invoked by appellants are: "The liability of the owner of any vessel . . . for any act, matter, or thing, less, damage, or forfeiture, done, occasioned, or incurred without the privity or knowledge of such owner or owners shall in no case exceed the amount or value of the interest of such owner in such vessel and her freight then pending." R.S.U.S. Sec. 4283; and, "the individual liability of a ship owner shall be limited to the proportion of money or debts and liabilities that his individual share of the vessel bears to the whole; and the aggregate liabilities of all the owners of the vessel on account of the same shall not exceed the value of such vessel and freight pending." 23 Stat. 57.

The Federal Statutes are admittedly dominant, and to these provisions, in case of repugnancy, state constitutions and laws must yield. The question, therefore, is of the meaning and scope of the Federal statutes. That they were enacted to put this country upon the same footing with other countries, and thus to encourage the building of ships and participation in the foreign carrying trade, is well known. "The rule of limited liability of owners of vessels is an ancient one . . .", and "should be applied, having regard to the purposes it is intended to subserve and the reasons upon which it rests." *Evansville and Bowling Green Packet Co. vs. Chero Colo S. Co.*, 271 U.S. 21; *Hartford Accident and Indemnity Co. vs. Southern Pacific Co.* (Decision U.S. Supreme Court Feb. 21, 1927.) In the latter case, after referring to several of its own decisions, the Court said: "It is quite evident from these cases that this court has by its rules and decisions given the statute a very broad and equitable construction for the purpose of carrying out its purpose and for facilitating a settlement of the whole controversy," etc. See also *Oregon R.R. and Nav. Co. vs. Balfour*, 90 Fed. 295; *People's Nav. Co. vs. Toxey*, 269 Fed. 793; *The Princess Sofia*, 278 Fed. 180; *The 84-H*, 296 Fed. 427; *The Omar D. Conger*, 1 Fed. (2d) 732; *Kitsap County Transp. Co. vs. Harvey*, 15 Fed. (2d) 166. And in view of the contentions which would flow from the adoption of appellee's contention, we are also to bear in mind the general rule that, "all laws are to be given a sensible construction; and a literal application of a statute which would lead to absurd consequences should be avoided whenever a

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and had been subjected to repeated surveys and inspections, none of which developed objection to the construction of the chain locker.

A further point involved in the case rests upon the libelants' failure to comply with the time to sue clause in the bill of lading, at least as regards several of the separate counts of the libel.

In giving judgment for the libelant, Judge Kerri-gan's opinion reads in part as follows:

Examination of the evidence leads me to hold that the Manchuria was not seaworthy, in that her chain locker was not water-tight. This is a question of fact to be decided independently of the results of surveys, inspections, and ratings at Lloyds or with the American Bureau of Shipping. *The R. P. Fitzgerald*, 212 Fed. 678; *Newhall vs. U. S.*, 8 Fed. 2nd 422. In this connection it is interesting to note that the Manchuria does not conform in construction to the later rules of Lloyds and the American Bureau of Shipping, which now require water-tight construction of chain lockers built abft the collision bulkhead. The Manchuria and her sister ship were twenty years old at the time these rules were enacted and were not reclassified because the rules apply to new construction. The rules, however, are of persuasive force in determining the regard or disregard in which this form of construction is held by modern maritime experts.

It is true, as urged by respondents, that standards of ship construction have changed and are changing and that a vessel which does not conform to the newest ideas of ship building is not unseaworthy on that account alone. Regard must be had to the nature of the defect in question, the damage reasonably to be expected therefrom, the nature of the cargo carried, and so forth. Tested by these standards I find the chain locker of the Manchuria to make her unseaworthy. It was not water-tight. Water normally found its way into it with the chain, and, in addition, frequently from the defective closing of the anchor chain pipes. It might reasonably have been foreseen that damage to cargo stowed in No. 1 hold might result, as in fact it did. Add to this the fact that it appears that the chain locker could have been made water-tight by fitting a collar about the main deck beams where they pass through the locker at a nominal cost, approximately \$300, and any force which might arise from respondents' argument that the ship should not be tested by the requirements of the recent standard of proper construction is lost.

Since the vessel is unseaworthy in this respect libelants must recover. It is urged by respondents, however, that libelants' right to recover as to counts nine to fifteen is barred by the Statute of Limitations, in that suit was not commenced thereon until more than five months from the date of shipments.

Notice of Claim Cause Again Upheld

The bill of lading provides: "The carrier shall not be liable for any claim whatsoever unless written notice thereof shall be given to this carrier at its port of discharge within ten days after removal of the goods from the wharf or vessel, even though such removal be by customs authorities. No suit to recover under this bill of lading or in respect to the goods shall be maintained unless instituted within five months after shipment of the goods hereunder notwithstanding the carrier may be a non-resident or foreign corporation. Nothing shall be deemed a waiver of the provisions of this section, except a written express waiver, signed by the carrier."

In the answer the failure to give notice of claim in time is specifically pleaded. The proof sustains respondents as to the failure to give notice as to the fifteenth count. Since the validity of such provisions as to notice has been repeatedly sustained (*The San Gug-*

lielmo, 249 Fed. 588; *The Turret Crown*, 284 Fed. 439), recovery on the fifteenth count must be denied on this ground.

On the question of the failure to bring suit on the ninth to fifteenth counts within five months from shipment, libelants have by stipulation admitted the dates of commencing suit to be after that time had run, but assert in the first place that this defense has not been sufficiently pleaded by respondents and, in the second place, that the five months limitation is unreasonable and void.

On the question of pleading it appears that a more specific pleading of the defense of failure to sue within five months may be desirable. And for this reason respondents may have ten days from date of filing this opinion to amend its answer in this regard, if so advised. The pleadings are sufficient to show no intention to waive this defense, inasmuch as the paragraph of the bill of lading containing the limitation clause is set forth in full and the dates of filing the libels, together with the stipulation on file as to such dates advise the court and libelants as well that counts nine to fifteen were not filed within the five months limitation period.

Libelants urge, however, that this limitation clause is unreasonable and hence invalid. There is no evidence in the record indicating any special hardship upon libelants arising out of this limitation. In the absence of such a showing the court cannot say as a matter of law that five months from the date of shipment is an unreasonable limitation period. Indeed the contrary view is supported by the fact that as to eight counts for damages occurring on this voyage libelants apparently found no difficulty in preparing and filing their libels within the time specified. *The Queen of the Pacific*, 180 U. S. 49; *The Archer*, 1925 AMC 1467.

For the reasons above stated let a decree be entered for libelants as to counts one to eight, inclusive, the amount of damages to be determined by reference to be hereafter made, as agreed by the parties prior to the submission of the case. Counts nine to fifteen to be dismissed. Costs to libelants.

Speeches and Such

The Study Class of the Association of Marine Underwriters of San Francisco, at their meeting of March 12 had the opportunity of listening to a thoroughly detailed exposition of the rules of the road as they apply to collisions at sea. Hunt C. Hill, admiralty attorney in San Francisco, who handled this somewhat technical and somewhat difficult subject, acquitted himself nobly.

A large part of the discussion was taken up with the treatment of the question of speed in fog collisions, usually an important element in accidents in the vicinity of San Francisco Bay. Mr. Hill also explained the starboard rule, the overtaking rule, the rule requiring the vessel having the right of way to maintain her course and speed, and other regulations pertinent to his subject. He closed with a resume of fact and decision in the case of *Dollar vs. Mauna Ala*.

Mr. Hill was followed by P. J. Seale, the genial and able cargo surveyor who bears the same relation to San Francisco's salvage business as Babe Ruth does to the baseball industry. Mr. Seale explained the types of fresh and salt water damage to which various commodities were susceptible, using samples of canned goods, coffee, etc., to illustrate his remarks. He further went

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on record as favoring the establishment of a central reconditioning and salvage plant which should be operated by and for the benefit of ship owners and cargo underwriters. He felt that this innovation would do away with a great deal of delay and expense incidental to the employment of private plants to dry and otherwise recondition damaged cargo.

On April 23 the assembled underwriters were furnished some eye and ear entertainment by William Aldrich, of the Metal & Thermit Corporation, who gave a detailed description of the operation of the thermit welding process in repairing metal parts of steel vessels. His talk was illustrated by a reel of motion pictures showing the thermit weld to the stern frame of the steamship Northern Pacific during the war. Mr. Aldrich pointed out that the process had been approved by Lloyds and that its employment resulted in a great saving over the old system of discarding the broken or cracked part. The welding process on an ordinary job takes about three or four days, and can be used on any shaft, skeg, or other member of the stern frame assembly.

The second speaker of the evening was Winfield Thompson, Pacific Coast field agent for the Panama Pacific Line, whose subject was "The Panama Canal and Its Effect on Trade." Mr. Thompson took his listeners on a tour of the Canal Zone, his remarks being illustrated by color slides showing the surrounding scenes of interest and the administrative and mechanical features of the artificial waterway.

The final, and in some respects the best meeting of the year, was held on May 7, when the class spent the first half of the evening in its usual quarters listening to Russell A. Mackey of McCutchen, Olney, Mannon & Greene, and the second half in the office and laboratory of Curtis & Tompkins, chemical engineers, where they learned something of the methods of chemistry in testing for salt water damage and other forms of contamination.

Mr. Mackey delivered a concise address on "Tort Jurisdiction in Admiralty," pointing out in his introductory remarks the importance of selecting the proper tribunal before which to bring action. He gave a resume of the decisions in personal injury cases, laying stress upon the conflict between the contractual and locational theories of jurisdiction.

"If a ship damages a pier or bridge," said Mr. Mackey, "the owner of the land structure may not sue in admiralty for his loss, since the injury was consummated on land, but if the ship is damaged, her owner may sue in admiralty."

The speaker also noted the inconsistency of the law in regard to personal injuries occurring on the gangplanks or on ladders from or to vessels, in which it has been held that a man injured while leaving a vessel may sue in admiralty even though the injury occurred while he was on the gangplank, but that a man injured on the gangplank while boarding a vessel must rely upon state law on the theory that he has not yet reached the ship.

The entire thirty members of the class then proceeded to the laboratory of Curtis & Tompkins, where Philip W. Tompkins, the genial president of the organization, proceeded to take them back to their college days by demonstrating the methods employed in detecting various types of damage to cargo. It was shown by experiment that the nitrate reaction in determining salt water damage was not necessarily conclusive, and that the only method of proving such damage was by a combination of tests designed to arrive at the correct solution of the problem by the science of elimination. After a demonstration of samples showing pollution and overheating damage to various types of vegetable oils, Mr. Tompkins took the class on a tour of his laboratory, explaining the various equipment, and in true bridge-party style, served samples of salted peanuts cooked in coconut oil, which the underwriting members seemed to enjoy far more than their recent professional contact with peanuts during the 1927 season.

Books Received

THE HARBOR PLAN OF CHICAGO. 100 pages, profusely illustrated with colored plates, half-tones, diagrams and maps; being the report of the Committee on Chicago Harbor and Survey of the Commercial Club of Chicago, 608 South Dearborn Street, Room 1740, Chicago. Price \$3.

This report, published late in 1927, outlines and illustrates a plan of proposed developments by which Chicago would prepare herself for the marine commerce which will inevitably come to the great central metropolis when the deep water channel systems of the St. Lawrence, Great Lakes and Mississippi, now under way or projected, shall be complete. The report sets a very high ideal and draws its plans large, with "order" as a watchword and "beauty" as a beacon.

The plan proposed by the committee consists of five main projects under each of which there would be several stages of development. The five projects are:

(1) Chicago River Harbor. Improvement of the present municipal pier and a duplicate pier on the south side of the river mouth.

(2) An Illinois Waterway Barge Terminal with adequate warehouse facilities at a point central to the entire city.

(3) An industrial barge harbor at Lake Calumet.

(4) A complete commercial and industrial harbor with rail and waterway connections, located at the state line south of Calumet river.

(5) An improvement of the waterway systems to give direct connection to the Indiana industrial area.

GENERAL AVERAGE LAW AND RULES. by Sanford D. Cole, 110 pages, compact pocket size; bound in red buckram with black stampings; published by Effingham Wilson, 16, Copthall Avenue, E. C. 2, London. Price 4 shillings net.

This is another excellent handbook by that thorough-going British barrister Sanford Cole, compiled for those merchants and shipping men who need a simple, practical treatment of the general theory of shipping documents and of the York-Antwerp Rules of 1924. Adequate references are given both to the more exhaustive English treatises on this and allied subjects and to specific cases in Admiralty.

The knowledge compressed into this little volume might, under certain conditions, be worth almost any figure to a shipping executive.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by E. J. McFARLANE

Passage of Jones-White Bill Brings Hope to American Shipyards

Matson Navigation Company Planning Two Liners

The House on February 22 passed the Jones-White bill, which authorizes the construction of a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels. The bill also authorizes the Secretary of the Navy to acquire such vessels for the United States Navy. The bill is expected to pass the Senate in the near future.

As a further aid to the American operator in foreign trade, the bill provides for the construction of a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels.

Among the firms who have indicated their intentions to take advantage of the provisions of the Jones-White Bill is the Matson Navigation Company. W. P. Roth, president, recently stated that his company is preparing plans for the construction of three steam-turbine vessels for the Oceanic Line, operating between San Francisco and New Zealand and Australia. These vessels will have a capacity of 10,000 tons, and their addition to the line will provide a monthly fast mail, passenger, and freight service between Pacific Coast ports and Australia.

Dollar Steamship Company Expresses Intentions to Build

On his arrival in San Francisco on May 24 after a tour of Europe, R. Stanley Dollar, vice-president and general manager of the Dollar Steamship Company, which operates the American Mail Line out of Seattle and San Francisco to the Orient and the Dollar Line round-the-world service, made the following statement:

"Passage of the Jones-White bill, which has just been signed by President Coolidge, means that the federal government has confidence

in the American shipbuilding industry. It is a great relief to the American shipbuilder to know that the federal government is willing to support the American flag on its ships. This is a great step forward for the American shipbuilding industry."

Mr. Dollar further stated that his company is preparing plans for the construction of three steam-turbine vessels for the Oceanic Line, operating between San Francisco and New Zealand and Australia. These vessels will have a capacity of 10,000 tons, and their addition to the line will provide a monthly fast mail, passenger, and freight service between Pacific Coast ports and Australia.

Other Ship Construction in Prospect

At the same time, the construction of shipping vessels is being planned by other firms. The United States Navy is planning to acquire a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels. The Navy is also planning to acquire a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels.

Senate Committee Approves Naval Construction Bill

The Naval Construction bill (H. R. 11526) authorizing appropriations totaling \$274,000,000 for the construction of 15 light cruisers and one aircraft carrier during the next three fiscal years was favor-

ably passed by the Senate on May 24. The bill is expected to pass the House in the near future.

The bill in the form in which it was ordered reported to the Senate reads essentially as follows:

"That the Secretary of the Navy be and he is authorized to acquire a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels."

The bill also authorizes the Secretary of the Navy to acquire a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels.

The bill also authorizes the Secretary of the Navy to acquire a new class of steamships, including American vessels, and requires that the United States flag be used on such vessels.

And provided, further, that the first and each succeeding alternate cruiser upon which work is undertaken, together with the main engines, armor, and armament for such cruisers, the construction and manufacture of which is authorized by this Act, shall be constructed or manufactured in the Government navy yards, naval gun factories, naval ordnance plants, or arsenals of the United States except such material or parts thereof as the Secretary of the Navy may find procurable by contract or purchase at an appreciable saving in cost to the Government.

Sections 2, 3, and 4 cover requirements relative to reports to the budget committee and allow for special emergencies such as extension of the limitation of armament agreements.

Section 5 directs the Secretary of the Navy to present to the Congress on or before December 10, 1928, preliminary plans, specifications, and estimates of cost for the construction of two salvage vessels for use in ship disasters.

Whaling Fleet to be Augmented

The California Sea Products Company, San Francisco, one of the largest, if not the largest, whaling concerns on the Pacific has out-

lined an extensive expenditure for floating equipment.

Captain F. K. Dedrick recently returned from the operating base at Santa Rosa Island. The building program will include two 15-knot killer boats to cost \$175,000 each, in addition to reconditioning of the whaler Port Saunders, which was sunk in San Francisco Bay last year, at a cost of \$50,000.

New Tacoma Fireboat Still Under Consideration

Plans have not yet been formulated for the construction of a fireboat and fire alarm system for Tacoma, Washington. A naval architect will be named shortly to design the boat, at which time the details will be published in this column.

House Favors Funds for Reconditioning Two Steamships

The House of Representatives on May 3 accepted the Senate amendment to the Independent Offices Appropriation bill to proceed with the reconditioning of the steamships Mt. Vernon and Monticello at a total cost not to exceed \$12,000,000. The Newport News Shipbuilding & Drydock Company is said to have plans all prepared for the reconditioning of the Mt. Vernon.

While details are not available, we understand that Cox & Stevens, 341 Madison Avenue, New York, have called for bids for a diesel trawler of about 140-foot length and to be of 600 shaft horsepower.

The Beacon Oil Company, of Boston, is planning the construction of a sister ship to the coastwise diesel tanker Colonial Beacon, built by the Sun Shipbuilding Company last year. The vessel is 263 feet over-all and powered with two 360-horsepower Fairbanks-Morse diesel engines.

The Atchison, Topeka & Santa Fe Railway of San Francisco is planning the construction of another steel carfloat for San Francisco Bay. Two carfloats have been built for this company within the last six months, one by The Moore Dry Dock Co. and one by the Union Plant of Bethlehem Shipbuilding Corp.

Cox & Stevens, 341 Madison Avenue, New York, are said to be working on plans for the construction of a new fireboat for the City of Galveston, Texas.

Hudson River Night Line Plans Two Vessels

The Hudson River Night Line, New York, has completed plans for two large diesel-driven, automobile, freight, and passenger vessels for operation on the Hudson River between New York, Troy and Albany. The plans have received the approval of the war department, and the company has applied to the Shipping Board for a loan to cover one-half the estimated cost of construction, which is \$1,500,000 for the two.

According to the details of the plans these vessels will be 325 feet long, 52 feet beam, 12 feet draft, powered with 1500 horsepower diesel engines, giving a speed of 16 knots. The main deck is designed to carry ninety automobiles or trucks, loaded or empty.

Bids Opened on Barge Equipment for New York Central

Dravo Constructing Company, Pittsburgh, submitted the lowest bids for 5 scows and 10 gasoline hoist barges recently opened by the Purchasing Agent of the New York Central Railroad, 466 Lexington Avenue, New York. The scows are to be 100 feet long; the price quoted by Dravo was \$26,500 each. The hoist barges are to be gas engine powered, Dravo Company quoting \$33,000. This plant also quoted \$33,850 each for diesel drive hoists.

Pulverized Coal Conversions Planned

Edwin C. Bennet, naval architect and consulting engineer of New York, is reported to be drawing up plans and specifications for the conversion of two freight vessels for the burning of pulverized coal.

Seagoing Diesel-Electric Car Fer-

According to reports received at this office a company has been or-

ganized to operate a car, passenger, and automobile ferry service between Galveston and New Orleans, and three special type vessels are to be built for this service at an estimated cost of \$1,000,000 each. A. S. Bergendahl, marine engineer, of Houston, Texas, is drawing up plans and specifications for this construction. The vessels will be about 470 feet long, 70 feet beam, and 10 feet 6 inches depth. They will be powered with diesel engines developing electrical energy which will drive twin screws. The vessels are planned to carry about 50 freight cars and 84 automobiles. Accommodations will be provided for 136 first class, 48 second class, and 60 steerage passengers, and the public rooms, dining rooms, and galley and pantry equipment, as well as the auxiliaries for handling cars and freight will be of the most modern and economical types.

Shipping Board Opposes Wilder Plan

In response to a resolution of the Senate to report on the proposal of the Transoceanic Corporation, headed by Lawrence R. Wilder of the American Brown Boveri Electric Corporation, to build six 33-knot vessels for the North Atlantic trade, the Shipping Board in a lengthy report has expressed its disapproval. The Shipping Board contends that the vessels could not be built within the estimate made by the projectors and that the cost of operation would exceed the estimates of the Transoceanic Company. In the report the Board advised the Senate that, in disapproving the proposal, it made its decision without prejudice to the recommendations which it has made in the past for the development of fast passenger and mail liners as running mates to the Leviathan and to keep abreast of the progress being made by foreign lines.

Recent Orders at the Shipyards

American Bridge Company, Pittsburgh, Penn., has an order from the Mississippi River Comm. at Memphis for 5 sand and gravel barges, 120 x 30 x 7 ft.

American Brown-Boveri Electric Corp., Camden, has an order from the Pennsylvania Railroad Co. for a steam lighter; and seven steel carfloats.

Bath Iron Works, Bath, Maine, has an order for three trawlers for O'Hara, Dunn, and Basalacchi Bros. to be 123' over-all; 23' molded

beam; 13' molded depth; to be powered with 400 B.H.P. Fairbanks-Morse diesel engs.

Dubuque Boat & Boiler Works, Dubuque, Iowa, has an order from the U.S. Engineers Office, Vicksburg, Miss., for two steel hull mooring barges to cost \$25,800 each.

Dravo Contracting Co., Pittsburgh, has an order from the Keystone Sand & Supply Co. for six steel barges, 135 x 27 x 8 ft.

Federal Shipbuilding & Drydock Co., Kearny, N.J., has an order from

The Old Dominion Corp., New York City, has been awarded a contract for the construction of a new ship.

The Pusey & Jones Corp., Portland, Me., has been awarded a contract for the construction of a new ship. The ship is to be built at the company's shipyard in Portland, Me.

The Moore Dry Dock Company, Oakland, Cal., has been awarded a contract for the construction of a new ship. The ship is to be built at the company's shipyard in Oakland, Cal.

General Engineering & Dry Dock Co., Alameda, Cal., has been awarded a contract for the construction of a new ship. The ship is to be built at the company's shipyard in Alameda, Cal.

Canadian Vickers, Ltd., Montreal, Canada, has a contract from the Canadian Pacific Railway for the construction of a new ship. The ship is to be built at the company's shipyard in Montreal, Canada.

Marietta Manufacturing Company, Point Pleasant, West Va., has a contract for the construction of a new ship. The ship is to be built at the company's shipyard in Point Pleasant, West Va.

Midland Barge Co., Midland, Pa., has an order from the Division of Canals and Waterways of the State of New York for four dump scows and six deck scows.

REPAIRS

Bethlehem Shipbuilding Corp., San Francisco, has been awarded a contract for the repair of a ship. The ship is to be repaired at the company's shipyard in San Francisco.

The ship is to be repaired at the company's shipyard in San Francisco.

More Dry Dock & Repair Company, Portland, Me., has been awarded a contract for the repair of a ship. The ship is to be repaired at the company's shipyard in Portland, Me.

LAUNCHINGS

The Straits of Mackinac, auto ferry for State of Michigan by Great Lakes Engineering Works, Apr. 26.

Diesel tug for Great Lakes Shipbuilding Corp., Apr. 26.

Steel tug for Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, May 19.

DELIVERIES

Steel dredge hull for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., San Francisco, Apr. 16.

Four covered barges to Carnegie Steel Co. by American Bridge Co., during Apr.

Robert W. Stewart, tank steamer for Standard Oil Co. by American Shipbuilding Co., Apr. 7.

Pontoon lock gate lifter to Dept.

of Railways and Canals of Canada by Collingwood Shipyards, Ltd., Apr. 10. Delivery to the Bureau of Marine Engineering, Apr. 5.

Steel tug for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., Apr. 26.

Steel tug for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., Apr. 26.

Steel tug for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., Apr. 26.

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Steel tug for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., Apr. 26.

Steel tug for U. S. Smelting & Refining Co., Bethlehem Shipbuilding Corp., Apr. 26.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of May 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS

Portland, Oregon

Steel tug for U. S. Smelting & Refining Co., Apr. 26.

Steel tug for U. S. Smelting & Refining Co., Apr. 26.

Steel tug for U. S. Smelting & Refining Co., Apr. 26.

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Steel tug for U. S. Smelting & Refining Co., Apr. 26.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

UNION PLANT

Pottery Works, San Francisco

Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

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Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

Steel dredge hull for U. S. Smelting & Refining Co., Apr. 16.

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Small Sizes Carried in Stock in California by

Frederick & Galvan San Francisco & Wilmington

San Diego Marine Constr. Co. San Diego

The McCallery Co. San Diego

Three steel dredge hulls, sisters to above. 100'x50'x11 1/4"; 6 cu. ft. buckets; deliver Apr. 1/28 est.

Waialeale, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 17'4 1/2" loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 4000 S.H.P.; 2 Babcock & Wilcox water tube boilers; 12 2-bar sq. ft. heating surface; keel Nov. 15/27; launched Mar. 3/28; deliver June 1/28 est.

LAKE WASHINGTON SHIPYARDS, Houghton, Wash.

Purchasing Agent: A. R. Van Sant. Bainbridge, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P. 57' beam; 800 I.H.P. Washington-Estep diesel eng.; launch May 15/28 est.

Cannery tender for New England Fish Co., Seattle, 72' length; Washington-Estep diesel eng.; launched.

Purse seine boat for Dick Suryan; 72' long; 180 H.P. Washington-Estep diesel eng.

River boat for Capt. Frank Kern; 60' long.

THE MOORE DRY DOCK CO. Oakland, California.

Purchasing Agent: N. Levy. Two flat wood barges for Raymond Concrete Pile Co., San Francisco; 110'x34'x9'. Two caissons for Foundation Co., San Francisco; 64' long; 59'6" breadth; 26' high; launched and delivered Apr. 20 and May 1/28.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar. Ten covered barges for Carnegie Steel Co.; 175'x26'x11'; 8 delivered.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7'.

Six barges for Union Barge Line; 132 x 35 x 10 ft.

Ten covered barges for Carnegie Steel Co.; 175'x26'x11 ft.

Forty-one barges for Mississippi River Commission; 120'x30'x7 ft.

Five sand and gravel barges for Mississippi River Comm., Memphis; 120'x30'x7'.

AMERICAN BROWN-BOVERI ELECTRIC CO., Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hull 374, houseboat, owners not named; 64'x27'x5'6" mld.; deliver May 27/28 est.

Hulls 376-377, two catboats, Reading Company; 250'9" x 34'7" x 9" mld.; keels May '28 est; deliver Aug. '28 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel July '28 est.; deliver Dec. '28 est.

Hull 379, catboat for Pennsylvania Railroad Co.; keel July 28/ est; deliver Oct. '28 est.

Hulls 281 to 286, inc., catboats for Pennsylvania Railroad Co.; keels summer '28 est.; deliver fall '27 est.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent, C. H. Hirschling. Robert W. Stewart, hull 802, tank steamer for Standard Oil Co. (Indiana); 373 L.B.P.; 52 beam; 20 loaded draft; 12 mi. loaded speed; 6200 D.W.T.; 1800 I.H.P. triple expansion engs; 2 Scotch boilers, 15'4 1/2" x 11'6" x 180 lbs. pressure; keel Aug. 29/27; launched Dec. 3/27; delivered Apr. 7/28.

Not named, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 feet beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Warkop diesel engs.; aux. Scotch boiler; keel Dec. 12/27; launch June 1/28 est; deliver Aug. 1/28 est.

BATH IRON WORKS Bath, Maine

Vanda, hull 117, twin screw steel diesel yacht; 240'x36'x22"; two 1500-B.H.P. Bessemer diesel engs.

Not named, hull 118, single screw steel diesel towboat; 43'x10'; 50-B.H.P. Cummins diesel eng.

Boston College, hull 119, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x23'x14'; 400 B.H.P. Fairbanks-Morse diesel eng.

Holy Cross, hull 120, trawler, same as above.

Georgetown, hull 121, trawler, same as above.

Not named, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse, for Detroit & Windsor Ferry Co.; 156 horse turbines and motors; 3000 S.H.P.; launched May 19/28; deliver Aug. '28 est.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Edward F. Farrington, diesel-elec. fr. for Middlesex Transportation Co., New Brunswick, N.J.; 131 x 31 x 11 ft.; Winton-General Electric machinery; electric auxiliaries; 12 mi. speed; delivered Apr. '28.

Not named, steel passenger and freight steamer for the New England Steamship Company, Newport, R.I.; 202 L.B.P.; 36 molded beam; 14'6" molded draft; 1082 gross tons; 4 cyl. TE eng.; B. & W. boilers, coal burning.

Not named, hull 1418, steel passenger and freight steamer for the Pennsylvania Railroad Co., Wes Philadelphia; 300 ft. length; TE engs.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Hull 80, pontoon lock gate lifter for Dept. of Railways and Canals of Canada; 30'x30 ft.; delivered Apr. 30/28.

Hull 81, motor scow for Brown Corporation, Quebec, 50'x12'x4'; delivered April 5/28.

Hull 82, hopper barge for Dept. of Railways and Canals of Canada; 180 L.B.P. 32 beam; 13 loaded draft; 8 mi. loaded speed; 800 D.W.T.; 700 I.H.P. TE engs.; 2 Scotch boilers, 12'6" diam.; keel Mar. 21/28; launch June 30/28 est.; deliver July 19/28 est.

CONSOLIDATED SHIPBUILDING CORPORATION Morris Heights, N. Y.

Hull 2895, day cruiser, 50 ft. for stock;

180 H.P. Speedway engs.

Hull 2896, cruiser for Paul H. Deming; 2-155 H.P. Speedway engs.

Hull 2897, cruiser for New York Clubman, 95 ft.; 2-300 H.P. Speedway engs.

Hull 2898, cruiser for J. L. Parsons, 82 ft.; 2-300 H.P. Speedway engs.

Hull 2900, cruiser for R. L. Skofield, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2901, tender, for J. H. Seaman, 19'6"; 1-25 H.P. Speedway eng.

Hull 2903, cruiser for New York yachtman, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2905, commuter boat for Harrison Williams; 56 ft. length; 2-650 H.P. Wright Typhoon engs.

Hulls 2906-11 inc. 6 play boats for stock. Hull 2912, 68-ft. cruiser for Richard Hellman; 2-170 H.P. Speedway engs.

Hull 2913, 50-foot cruiser for T. C. Henry; 170 H.P. Speedway eng.

Hull 2917, 57-ft. cruiser for S. Rothchild; 2-170 H.P. Speedway engs.

Hull 2919, 57-ft. cruiser for Wm. Ryle; 2-170 H.P. Speedway eng.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W. E. Whitehouse. Grathale II, hull 125, yacht for E. T. Strong, Flint, Mich.; 57'x13'x4'; 13 mi. loaded speed; 22 D.W.T.; 200 I.H.P. gas engs.; keel Aug. 1/27; launch and deliver Apr. 1/28 est.

Luanco, hull 123, steel yacht, owner not named; 105' L.B.P.; 17 beam; 6 loaded draft; 13 loaded speed; 110 D.W.T.; 120 I.H.P. diesel eng.; keel July 11/27; launch Apr. 15/28 est.; deliver June 1/28 est.

Memory III, hull 126, steel yacht for A. E. Fitkin, New York; 141'8" L.B.P.; 23'2" beam; 8' draft; 15 mi. speed; 350 D.W.T.; 900 I.H.P. diesel engs.; keel Nov. 15/27; launch May 15/28 est.; deliver July 1/28 est.

Sea Sails III, hull 127, wood yacht for Murray W. Sales, Detroit; 89' L.B.P.; 16' 9" beam; 8' loaded draft; 13 mi. speed; 75 D.W.T.; 160 I.H.P. diesel eng.; keel Jan. 12/28; launch May 1/28 est.; deliver May 15/28 est.

Elto, hull 128, wood yacht for T. A. Yawkey, New York; 56'x11'x3'; 26 mi. speed; 35 D.W.T.; 400 I.H.P. gas engs.; keel Feb. 15/28 est.; launch June 1/28 est. delivery July 1/28 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'26" x 26'6" x 5' 6".

Hull 656, 1 steam dredge for Ohio River Sand Co., Louisville, Ky.; 155'x44'8 ft.; 480 gro. tons.

Hull 669, floating A frame hoist for U. S. Engineers, Louisville, Ky.; 205 gro. tons.

Hull 672, dipper dredge hull for Monongahela & Ohio Dredging Co.; 83'x30'x6'.

Hulls 675-679 inc.; five steel barges for Hainesport Mining and Transp. Co.; 130'x34'x10'.

Hull 680, hopper type steel barge for Hainesport Mining and Transp. Co.; 71'6" x 24'x6'9 1/2"; 170 gr. tons.

Hulls 688-690 inc., three standard Dravo steel barges for stock; 250 gr. tons ea.

Hulls 691-694 inc., four steel catboats for New York Central Railroad Co.; 270'x38'x10'9"; 850 gro. tons ea.

Hulls 697-704 inc., 8 std. steel barges for stock; 100'x26'x6'6"; 135 gro. tons ea.

Hull 705, mixer boat for Contract Dept.; 91'x40'x6'3"; 150 gro. tons ea.

Hull 706, steel barge for stock; 130'x34'x8'9"; 320 gro. tons.

Hull 707-708, two steel barges for stock; 100'x26'x6'6"; 135 gro. tons ea.

Hull 141, deck barge for Big Rock Stone & Mat. Co.; 100'x26'x6'6"; keel Apr. 3/28; delivered Apr. 25/28.

Hull 142, tug for stock; 44'x9'6"x4'3"; 80 H.P. Worthington diesel.

Hull 143, deck barge for International Cement Co.; 180'x40'x9'6"; keel Mar. 21/28; delivered May 3/28.

Hull 144, same as above; keel Apr. 2/28; delivered May 24/28 est.

Hull 145, same as above.

Cathrine D, hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P. diesel engs.; keel May 15/28 est.

Hull 147, deck barge for Standard Unit Nav. Co.; 49'x16x6 ft.; keel Feb. 27/28.

Hull 148, hopper barge for Standard Unit Nav. Co.; 49'x16x6 ft.; keel Feb. 29/28.

Hull 149, towboat for Standard Unit Nav. Co.; 92'x24'x5 ft.; keel May 10/28 est.

Hull 150, deck barge for stock; 120'x30'x6 ft.; keel May 6/28 est.

Hulls 151-152, two deck barges for stock; 100'x24'x5 ft.

Hull No. 153, dredge hull, 100'x30'x4'; keel June 17/28 est.; complete July 21/28 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement; keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launched Feb. 25/28; deliver May 17/28 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launch Sept./28 est.

W. J. Harahan, hull 327, tugboat for Chesapeake & Ohio Railway Co.; 109' L.O.A.; 28 beam; 14'6" depth; one screw; T.E. eng.; Scotch boiler; coal burning; keel Jan. 16/28; launched Mar. 31/28; delivered Apr. 26/28.

Not named, hull 328, steel yacht for Geo. T. Baker, Jr.; 1200 gross tons.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft; 18 1/2 mi. speed; 1784 gross tons 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27; launched Feb. 6/28; deliver July 1/28 est.

Colleen, hull 1036, steel twin screw diesel yacht for Samuel A. Salvage, New York; 150 L.O.A.; 139'9" L.W.L.; 22 beam; 7'6" loaded draft; 18 miles speed; 246 D.W.T.; 2 Winton diesel engines; 600 H.P. each; keel Oct. 15/27; launched Mar. 10/28; delivered May 1/28.

Not named, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; launch Aug. 1/28 est.; deliver Sept. 1/28 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va. General Charles F. Humphreys, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel June /27; deliver June /28 est.

Not named, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450 I.H.P. engs.; keel Feb. 18/28.

STATEN ISLAND SHIPBUILDING CO., Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller. Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers.

SUN SHIPBUILDING COMPANY Chester, Penn.

Purchasing Agent: H. W. Scott. Not named, hull 110, motor tanker for Sun Oil Co.; 480 L.B.P.; 65' 9" beam; 37' draft; motive power not yet determined; keel Dec. 21/27; launch June 9/28; deliver July 21/28 est.

Hull 111, oil barge for Utility Oil Corp.; 175'x36'x12'6"; keel Apr. 16/28; launch June 23/28 est.; deliver July 3/28 est.

Hull 112, carfloat for Reading Railroad; 200'x34'x7'9"; keel May 21/28 est.; launch July 14/28 est.; deliver July 20/28 est.

Hull 113, same as above; keel May 21/28 est.; launch July 24/28 est.; deliver July 30/28 est.

Hull 114, same as above; keel June 1/28

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Trade, Traffic, and Shipping

Navy Helps Shipping and Foreign Trade

By H. E. Kays, Commander, United States Navy

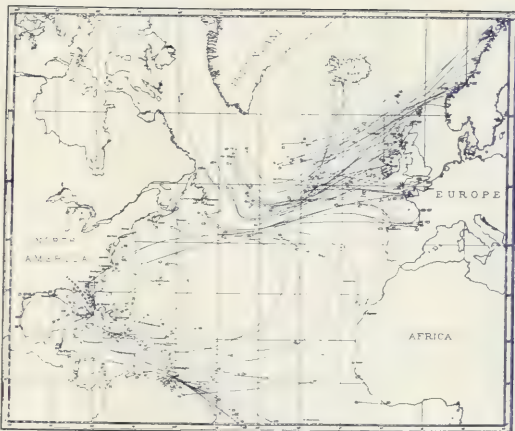
THOSE of the general public who think of the Navy as an instrument of war and militarism only probably do not know that there exists in the Navy, among its other peace promoting activities, the Hydrographic Office and its branches which are performing at all times an invaluable service to commerce and the merchant marine.

The Navy has been concerned in making charts for sea navigation since 1830. In December of that year a Naval Depot for taking charge of nautical charts and instruments was established in Washington, and in 1866 the nautical part of the work was turned over to the Naval Observatory. The Hydrographic Office was then organized under its present name and assumed the chart work.

Thus commenced the Hydrographic Office as it exists today, and it is interesting to see its influence for safety of shipping interests generally, as well as for the Navy. The Hydrographic Office is in the Navy Department. Here are established chart making facilities and means for collecting and collating the vast mass of information received for incorporation on charts and in its various publications.

To serve merchant ships, there are eighteen branch offices in as many prominent coast cities. These offices are all under the charge of naval officers or civilian nautical experts. The masters and officers of merchant ships are encouraged to visit these offices where information and advice about navigation is freely given. The office in San Francisco is on the Assembly Floor of the Merchants Exchange Building, next to the Marine Department of the Chamber of Commerce, an ideal location for serving the mariner. The watchword of the office is to never let anyone leave without an answer to his question, whether it is the Great Circle Distance to Honolulu or the best way to face his new house to get the morning sun in the dining room.

The Hydrographic Office maintains one or two naval vessels on survey duty to cover localities outside of United States coastal waters that have not been accurately surveyed. United States waters are surveyed by the Coast and Geodetic Survey of the Department of Commerce. Formerly naval officers did the surveying for this department, but it was discontinued at the outbreak of the Spanish American War on account of pressure of other duties. Copies of all Coast Survey charts are kept in branch hydrographic offices for inspection of anyone interested.



An interesting chart showing bottle drift in the North Atlantic Ocean. Bottle No. 32 of this group covered in its wanderings a distance of 9100 nautical miles, having been in the water 1530 days.

The Hydrographic Office furnishes navigational aids to all vessels of the Navy. Merchant vessels obtain their charts from agents of the Hydrographic Office in many seacoast cities and from the Coast Survey. A chart of every part of the world is available in the branch offices for inspection, but these cover only the oceans and adjacent coastlines.

A new activity of the Hydrographic Office is the preparation of charts for aviators. This service will be of increasing importance as civil aviation grows.

Besides chart construction and distribution, the Hydrographic Office gets out the following publications:

Weekly Notices to Mariners. These are corrections to charts and sailing directions, made necessary by late surveys, changes in buoys, lights, etc., and changes in channels and shoals. A monthly notice gives the latest aviation advice.

Pilot Charts. These are published monthly for the North Atlantic, North Pacific, Central American waters, and the Indian Ocean, published quarterly for the South Atlantic and South Pacific. A pilot chart of the Great Lakes region is published from time to time. These charts are not for navigation plotting, but contain a veritable mine of information as to expected winds, currents, ice conditions, sailing routes, etc.

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S.S. Colombia	June 25	July 22	S.S. Guinevere	June 23	July 1
W.M.S. City of S.F.	June 27	July 24	W.M.S. City of S.F.	June 25	July 2
S.S. Guinevere	July 1	July 18	S.S. Guinevere	June 27	July 4
W.M.S. City of S.F.	July 3	July 20	S.S. Guinevere	June 29	July 6
S.S. Guinevere	July 5	July 22	S.S. Guinevere	July 1	July 8
			S.S. Guinevere	July 3	July 10

(Ports of call: Mazatlan, Manzanillo, Champetico, San Jose de Guatemala, Acacuta, La Libertad, La Union, Amapala, Cozaco, San Juan del Sur, Puntarenas, Balboa and Cristobal.)

*Ports of call: Mazatlan, Champetico, San Jose de Guatemala, Acacuta, La Libertad, Cozaco, Balboa, Cristobal, Puerto Colombia, Havana (Westbound only), Cartagena (Westbound only) and New York.

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Hydrographic Bulletins are published weekly to supplement the information on the pilot charts.

Daily Memoranda in mimeograph form give the very latest information about changes, dangers, etc.

Besides these, the Hydrographic Office prepares books of **Sailing Directions** (the Blue Book of the sea), **Light Lists** of the world, and various technical navigational publications.

The Pilot Charts, Notices to Mariners, Hydrographic Bulletin, and Daily Memoranda are furnished free to the shipping public. All branch offices maintain large mailing lists of ships and shipping companies, to which they are sent as soon as received from the main office. The Branch Office at San Francisco sends out nearly 30,000 weekly notices to mariners in a year.

Now what does the Hydrographic Office, and the Navy, get in return for these services, besides good will. It gets the good will first. But to render possible these aids, voluminous immediate information is necessary. A buoy adrift cannot be broadcasted by radio unless someone reports it adrift. This is what merchant ships and men-of-war do. Besides reporting by radio, they are provided with forms for collecting data from which charts are made. It is a mutual system of cooperation that works in the interest of all concerned. All ships receiving free publications are requested to fill out and submit forms covering their last trip, the best routes, currents encountered, and unusual weather conditions. They also report on the facilities of foreign ports visited.

All important information received from any source, besides being relayed to the Hydrographic Office, is kept on file in the branches for the free information of anyone who wants it.

The taxpayer who furnishes the money to support the Navy should remember these duties of the Hydrographic Office and other branches of navy work that are performed by the navy for the mutual good of the country, and bear no relation to war or aggression.

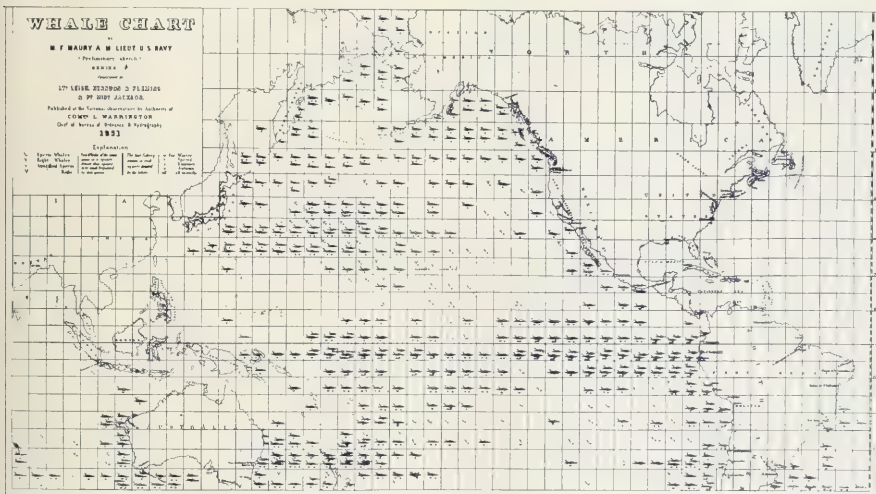
American Merchant Marine Reviewed by a Friendly Britisher

ALBERT RICHARD WETJEN, well-known British writer of sea stories and himself a practical seaman, has been making a six months trip from San Francisco around South America on a McCormick freighter. At Buenos Aires, Mr. Wetjen gave to the press an interview and a report covering his impressions of the American merchant marine. From this report we cull the following "high lights":

"There is no reason at all today why the American youth should hesitate to adopt the sea as a career. The American seaman works the shortest hours and is the best paid and the best fed in the world.

That the United States will have to aid and foster her merchant marine is a fact no one aware of international matters can deny. With a comprehensive and intelligent system of help the American shipowner can compete with all foreign lines and in time capture world trade. The first handicap the American shipowner is under is that if he builds his new vessels in the United States he must pay for them, due to higher wages and material costs, something like fifty per cent more than he would be asked for the same vessel if laid down abroad. Some system should be worked out by which the government can relieve the shipowner of this burden. Government ownership of the American merchant fleet is highly undesirable for many reasons and is antagonistic to private citizens who are bending their energies and finances towards the expansion of export trade.

Another immense help to the American merchant marine would be a rationalizing of the Marine Laws to make them no more burdensome to the shipper than similar laws of other nations. The law that makes it



One of Lieutenant Maury's famous whale charts of the Pacific. These charts were very much in demand in the palmy days of the American whale fisheries.

Around the world and down under

DOUGLAS I. advertisement, paid for by the Shell Company of California, is a very interesting and informative article on the subject of the world's largest oil company. The article is written by a man who has been in the oil business for many years and who has a deep knowledge of the industry. The article is well written and easy to read, and it provides a lot of interesting information about the oil business. The article is a good example of the kind of information that the Shell Company of California is interested in providing to the public.

SHELL COMPANY
OF CALIFORNIA



...the American master is further handicapped by the fact he cannot adequately punish a man. He simply has to take anything that comes his way. I have seen common seamen abuse masters, threaten, swear at them, and all the master is allowed to do under the law of the land is to fine such offenders merely a nominal sum. If a master pays off an unruly man in a foreign port, he does so against the strenuous protests of the consul, for the consul, if the man is paid off, has to find that man another ship and to keep him out of trouble with the local authorities, a thankless task.

There has been some talk of retaining the American merchant marine under government ownership, but this is to stifle the youth before manhood. Under private enterprise the stimulation to trade is immense. The Munson Line, for example, after buying their

ships from the Shipping Board and getting a steady trade monthly sailing to the Argentine, persuaded the South American farmers to raise grapes and honeydew melons to export to the United States. As soon as the results of this constructive work began to appear on New York markets, a movement was started in Congress to place a heavy tariff on the fruit, and a man had to be sent to carefully point out what any almanac would have told Congress, that fruit shipped from the Argentine conflicted in no way with the American market because of the utter difference in seasons, the melons and grapes arriving at the north in dead winter. In other words, the seasons for the Argentine and the United States being exactly opposite, it is easy to see how wide a field opens up. If the American merchant service can develop the proper fast refrigeration ships it will be possible to supply all America all the year round with fresh summer fruits.

The McCormick Line of the Pacific Coast has done in the timber business much as the Munson Lines have done in the fruit business. Buying their ships from the Shipping Board and settling to a steady monthly schedule completely round South America they have developed the Douglas Fir market in an unbelievable manner. Three years ago they shipped four to five million feet to the Argentine. Last year they shipped twelve million. This year it will run close to seventeen million. All this is new trade and means greater prosperity to the American people. If this merchandise had to be carried in foreign bottoms at least half of the benefits would be absorbed abroad."

Pacific Port Improvements

Stockton, Calif., expects by July 1 to be prepared to start work on the deep water channel which will make this port accessible for deepsea vessels. The federal government has authorized an expenditure of \$3,000,000 for dredging and the City of Stockton has voted bonds for a similar amount. The State of California has contributed \$417,000 for the acquisition of the required lands for port purposes. The federal government has appropriated an initial sum of \$335,000, to which Stockton will add a similar amount, and the first work will be done on the widening and deepening of the Suisun channel between Pittsburg and Antioch.

Pittsburg, Calif. The Johns-Manville Corporation has started construction of a 600-foot shipping wharf and the enlargement of its manufacturing plant here.

San Mateo, Calif. Work was started May 7 on a steel and concrete bridge over San Francisco Bay to connect San Mateo and Hayward and to cost \$7,500,000.

Oakland City Council has announced that beginning May 1 all piers will be operated by the City. James B. Taylor has been appointed manager of the Market Street Pier and the new Grove Street Pier.

Development under Oakland's extensive port building plan has progressed to the point where the federal government will start dredging operations to widen and deepen the channel from the Oakland estuary entrance to West Oakland, 33 feet deep, 400 feet wide, and 6000 feet long. The inner harbor will be dredged to a depth of 32 feet to Brooklyn Basin, where the Port Commission has announced plans for a 1500-foot quay wall. The Harbor Commission recently sold \$1,000,000 in bonds and the federal government has appropriated \$200,000 for this work.

The Petroleum Securities Company, Richmond, has received bids for the construction of a terminal.

San Francisco. The Board of State Harbor Commissioners recently awarded contracts for the extension of the Islais Creek Wharf. J. P. Holland, Inc., received contract for deposit fill, work to cost about \$23,000; Clinton Construction Co. received contract for construction of wharf, \$37,486.

Bids were opened May 23 for construction of wharf and building between piers 26 and 28.

In spite of protests of the residents of the Marina District, San

Francisco, a new residence district, the City of San Francisco recently granted a permit to the San Francisco Produce and Provision Terminals, Inc. for a \$6,000,000 plant adjoining Fort Mason.

Emeryville, Calif. The Paraffine Companies, Inc., have applied for a lease of the waterfront property owned by the City of Emeryville adjoining its plant, on which to build a shipping terminal. Construction of such a terminal would involve dredging to deep water of San Francisco Bay.

Richmond. California Construction Co., 58 Second Street, San Francisco, has been awarded the contract for the construction of the new inner harbor wharf on a bid of \$227,000. Other contracts bring the total cost of this unit of the new wharf system up to \$233,348.

Los Angeles Harbor. The Hancock Oil Company will enter the case oil export trade to Mexico and the Harbor Board has undertaken to build a \$61,800 loading station at Berth No. 215, Terminal Island, which will be of wood, 30 feet wide and 320 feet long.

The California Petroleum Company is expending \$750,000 for its loading station at this port.

Crescent City. A sum of \$250,000 has been allotted by Major-General Edgar Jadwin, chief of army engineers, to start work on the projected improvement of Crescent Bay. Bids have been called for materials for the initial work of rebuilding the sunken portions of the seawall and capping this with concrete. Work will start about July 1.

Portland. Western Oil & Refining Company has applied to the Portland Dock Commission for permission to construct an oil and gasoline terminal east of Terminal No. 4, plans including the construction of a 300-foot quay wall for docking of tankers.

Work is now progressing on the construction of a mile-long concrete seawall along the Willamette River at the foot of Main Street. Pacific Bridge Company has contract for the work.

The Chief of Army Engineers has allocated \$350,000 for deepening the lower Columbia river channel for deep draft vessels during the fiscal year beginning July 1, 1928.

Seattle. The Commissioners of the Port of Seattle on May 8 instructed Port Engineer J. R. West to proceed immediately with plans and specifications for a 1,000,000-bushel grain elevator to be built at

Smith Cove Terminal. Estimated cost is \$800,000. The grain elevator construction firm of John S. Metcalf & Co. of Chicago will design the equipment and machinery for the new plant. Bids will probably be called about December 1.

Extensive alterations are under way on the Colman Pier, used by Puget Sound passenger and automobile craft. The wharf will be lengthened by 250 feet and will be improved by special ramps and bridges for the loading of passengers and the parking of automobiles. Lee & Brinton, architects of Seattle, designed the improvements.

The Richfield Oil Company of Los Angeles is planning the construction of a large gasoline storage and shipping plant at Seattle to have a capacity of 200,000 barrels.

Honolulu. R. R. Tinkham, Superintendent of Lighthouses in the Honolulu District, announced that bids for the construction of a new pier for the lighthouse tender Kukui will be invited in June, for which a federal appropriation of \$58,000 is available.

Vancouver, B. C. The Northern Construction Co., Ltd., and J. W. Stewart & Co. of Vancouver, were awarded contract for the construction of the new 500,000-bushel grain elevator for the Midland Pacific Terminal, Ltd., at North Vancouver.

New Westminster, British Columbia. The Pacific Coast Terminal, Ltd., has been organized by Sir Henry Thornton, J. J. Warren, A. Melville Dollar, B. W. Greer, C. E. Disher, and other Vancouver shipping men, and the new firm plans the construction of a large port terminal to cost several million dollars.

Business of the Port of New Westminster increased by 40 per cent during the first quarter of 1928, as compared with the corresponding period of last year. Ships calling at the port during the first quarter of 1928 totaled 47, with an aggregate tonnage of 225,000, against 34 of 184,000 gross tons in the first quarter of 1927. A feature of the first quarter of this year was the great increase in shipments of bar metal, nearly 16,000 tons having been loaded, coming from the Trail smelter and consigned to markets in the United Kingdom and Japan. Lumber shipments also were heavy, amounting to about 45,000,000 feet, while 34,000 cubic feet of box shooks, 1,260,000 shingles, fruit, flour and general cargo also were exported.

Perth, Western Australia. The

harbor of Freemantle, the port of Perth, capital of West Australia, will be improved with the addition of a new bridge and berth accommodation of 6000 feet. Chief Engineer, Public Works, has plans.

Wellington, New Zealand. A floating dock for the port of Wellington will be contracted for by the Harbor Board, as soon as necessary details can be arranged. The general dimensions of the proposed dock, which is of the sectional box self-docking type, are as follows: net lifting power, 15,000 tons; over all length over platforms, 560 ft.; length of dock over pontoons, 503 ft.; overall width of dock, 114 ft.; clear width between fenders, 83 ft.; draught of water over keel blocks, 24 ft.; lifting time, 10,000 tons in

2 hours. Provision is made for future lengthening by a further 69 feet. The dock will be located at the end of the Thorndon sea wall. (Consul General W. L. Lowrie, Wellington.)

Work on third inner harbor at **Tandjong Priok, Batavia, Java**, was resumed at the end of April this year. A pier will be built upon sunken reinforced concrete caissons. This third inner harbor will be the deepest of all at Batavia. Its present depth is 10 meters (based on the depth of the Suez Canal), but this will be increased to 12 meters, so that the largest ocean going vessel may be accommodated with ease. The cost of the pier sub-structure is estimated at about 450,000 florins (\$181,179).

ornia to North of Hatteras, 83c and 85c, June loading (inter-company).

The French steamer **Louis L D** is reported fixed from San Francisco to the United Kingdom with asphalt, by **L. Dreyfus & Co.**

The following time charters are reported: Norwegian m.s. **Vestvard**, delivery Japan May, redelivery North of Hatteras via British Columbia; British str. **Ben . . .** Pacific trade, 4 months, delivery Vancouver, redelivery Japan 4/6, May; British steamer **Bradfyne**, North Pacific, delivery May, Canadian Transport Co.; British str. **Quebec City**, same; Danish m.s. **Nicoline Maersk**, North Pacific to Australia, June, Transatlantic S. S. Company; Danish str. **Gudrun Maersk**, Pacific trade, delivery and redelivery North of Hatteras, 85c, April; British str. **Ben . . .** 4 months, delivery Vancouver, redelivery Japan, 4/6.

The following sales have been reported: British bkt. **S. F. Tolmie**, \$10,000 reported (to be converted into a barge) **Hastings Mill Company** to **Nelson Brothers Company**; American bkt. **James Tuft**, \$4500 reported, **Geo. E. Billings Co.** to **Claude Cummings** of Los Angeles; American str. **Iris** (to be broken up), **Swayne & Hoyt, Inc.** to **Walter W. Johnson**; U. S. Tug **Iroquois**, \$36,000 reported, U. S. Navy Dept. to **Cary Davis Tugboat Co.** of Seattle; American str. **El Cicuta**, **James Griffiths & Sons** to **Kingsley Navigation Co.**; American tkr. **Wm. F. Herrin** (subj. inspection at New York), **Associated Oil Company** to Italian parties.

PAGE BROTHERS, Brokers.

Freights, Charters, Sales

May 17, 1928.

THE following steamers are reported fixed with grain to the U. K.-Continent: British str. **Dalemoor**, San Francisco, 27/-, May, Canadian American Shipping Co.; Brit. str. . . **Moor**, same, 30/-, July, **Strauss & Co.**; British str. **Badjestan**, Vancouver, May; Japanese str. **Cape Town Maru**, same, May; British str., San Francisco, 30/-, August, British str. **Urla**, Vancouver, June.

The following lumber fixtures to the Orient are reported: Japanese str. **Havre Maru**, Columbia River to Japan, May, **Nakata & Co.**; Japanese steamer **Ishin Maru**, Puget Sound to two ports Japan, \$9.10, J. W. Allen, Inc.; Norwegian m.s. **Fernhill**, Grays Harbor to Yokohama and Osaka, Canadian American Shipping Co., May/June.

The following steamers are reported fixed with lumber to the Atlantic: American steamer **Herman Frasch**, North Pacific to North of Hatteras, \$14, May-June, **E. R. Sizer & Co.**; American str. **C. A. Snider**, Coos Bay and North Pacific to New York, May, **Brady-Ketchum Lumber Company**; American str. **Lake Gorin**, North Pacific to New York, June; American str. **Commercial Guide**, North Pacific to Boston, June, **Blanchard Lumber Co.**; American str. **Lemuel Burrows**, North Pacific to North of Hatteras, June; American str. **Troutpool**, British Columbia to North of Hatteras, \$13.50, May, **Strange & Co.**; American str. **Oneida**, North Pacific to New York, \$14.75, May; American m.s. **Seekonk**, North Pacific to North Hatteras, \$14, May/June;

American m.s. **East Indian**, North Pacific to New York and Boston, \$14, July; American steamer **San Pedro**, Puget Sound to New York, May, **Hammond Lumber Co.**

A Smith steamer is reported fixed with sleepers from the North Pacific to U.K.-Continent at a lump sum of \$12,000, June/July loading, and British str. **Egglesstone** from the North Pacific to Rotterdam, lumber and general merchandise, June loading, by the Canadian American Shipping Co.

The following tanker fixtures are reported: American tanker **Watertown**, California to not east of New York, 78 cts., May loading, and two Pan-American tankers from Calif-

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The steamer **Shelton**, ex-Cuprum, first of seven Shipping Board freighters to come under the house flag of the Tacoma Oriental Steamship Company. These seven steamers are being named for towns immediately surrounding Tacoma. The **Shelton** was christened by Mrs. Mark E. Reed of Shelton on May 11.

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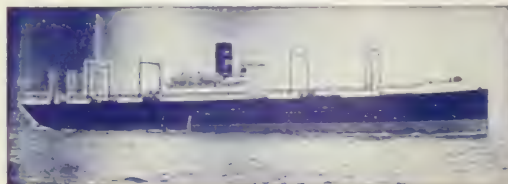
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Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

THE fine leadership of John C. Rohlfs, manager of the marine department of the Standard Oil Company of California, as chairman of the marine committee of the San Francisco Chamber of Commerce during the last four years, has resulted in his being elected a director of the Chamber of Commerce at its last meeting.

It was in October 1, 1924, that Mr. Rohlfs was selected by the body with the unanimous approval of steamship leaders to head the marine department of the chamber. Almost immediately upon heading the marine committee Mr. Rohlfs prevailed upon the chamber to enlarge the quarters of the marine department on the main floor of the Chamber of Commerce and also increase the force of workers.

Since that time, the marine department has kept progress with the development of the port of San Francisco and today it is looked upon as second to none in the world as a bureau of maritime information.

The committee that has so ably and unselfishly devoted its efforts to furthering the marine department under the directorship of Mr. Rohlfs includes Captain N. J. Kane, Arthur W. Meyers, Captain J. G. Ludlow, J. C. McCabe, Frank J. O'Connor, Hugh Gallagher, M. J. Buckley, William P. Bannister and Captain W. J. Peterson. J. P. Williams is secretary of the body and Abe Marks is manager of the marine department.

T. H. Carrol, port engineer for the Inter-Island Steam Navigation Company, of Honolulu, arrived in San Francisco recently to remain until completion of the new passen-



John C. Rohlfs, manager of the marine department, Standard Oil Company (Calif.) and chairman of the Marine Department and director, San Francisco Chamber of Commerce.

ger liner *Waialeale*, by the Bethlehem Shipbuilding Corporation. Built for the inter-island trade, the vessel's construction was under supervision of G. K. Nichols, manager of marine engineering and repairs for the Matson Line.

After an illness of five months, **Stephen B. Gibbs**, chief surveyor of the San Francisco Board of Marine Underwriters in the Northwest, passed away in Seattle. Mr. Gibbs was widely-known throughout the marine world. In 1902, Gibbs opened the Seattle offices of the San Francisco Board of Marine Underwriters as chief surveyor, a position he held until he died.

Matt J. Lindsay, freight traffic manager of the Matson Navigation Company, is expected to return home early this month after business and inspection trip of Eastern seaports.

Daulton Mann, general manager of the Panama Mail Steamship Company, announced that the liners *Santa Ana* and *Santa Luisa*, recently secured from W. R. Grace & Company for its passenger and freight service between California, Central America, and New York by way of the Panama Canal, will be renamed the *Guatemala* and *Salvador* in honor of the two countries.

The **McCormick Steamship Company** has secured the Southern California agency of the Bruusgaard Line, which is operating a monthly service in the European-Pacific Coast trade. Six vessels of the line call at Pacific Coast ports, offering both east and west-bound service. Under the new arrangement the steamer *Rigi* will clear from Los Angeles harbor early in July. This company has a sufficient number of steamers and motorships to augment the service as business develops. The steamer *Hermion* of this line recently cleared Pacific Coast ports with a full cargo for Liverpool, Havre, Rotterdam, and Antwerp.

Bishopshbourne, a Kent village near Canterbury, is the mecca for ancient mariners, and every day finds a number of them comfortably rocking on the new **Joseph Conrad Memorial** porch and dreaming of the days when the seas were peopled with wooden ships and iron men. These old salts regard the great sea author as their personal property. They regard him as one of the few writers who could write about the sea without having sea dogs turn up their noses.

These veterans look askance at the crowds of literary visitors from all over the world who also visit the memorial porch of the Bishopshbourne town hall to examine the tablet dedicated to the great Polish author who became a British subject and adopted English as his writing medium because it was so much richer in sea terms than any other language. This town was the home of Conrad during the last five years of his life. Mrs. Theodore

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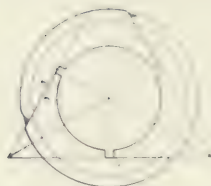
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Roosevelt was among the first to contribute to the memorial. Shaw, Hardy, Kipling, Galsworthy, and scores of other famous personages contribute to its upkeep.

R. C. Thackara, chairman of the United States intercoastal west-bound conference, was a recent visitor to Pacific Coast ports. This was his first visit since the organization of the conference and he arrived by rail from New York, stopping off at Seattle. His trip was made to get acquainted with shippers and representatives of member lines and he did not attempt to transact any definite business.

After ten years of planning, the **San Pedro Bilge Club** has opened its doors as a gathering place for shipping men of the world. The Bilge Club is one of the most unique in the ports of the world. A club room and private dining room are fitted with anchor chandeliers a ship's clock, running lights, and a binnacle taken from the lifeboat of the illfated tanker Chuky. The organization is the outgrowth of informal meetings of shipping men of the harbor district at lunch times.

Allan Botting, of the Matson Navigation Company's passenger department is the latest of the San Francisco steamship world to take a bride. The event occurred on May 6 and the bride was **Miss Marcelline Harte** of San Francisco, where the couple are making their home. The staff of the passenger department presented the couple with a number of beautiful gifts and "Aloha," official journal of the Matson Line, was the medium used by hundreds of other employees to wish them every happiness.

Emrys Williams of Captain Edwards' office, Matson Navigation Company, San Francisco, resigned effective May 31, after nearly five years of service with the company. Williams is planning a trip to his old home in Wales, where he will stay for several months, later returning to San Francisco.

Henry J. Wolters is now port engineer for the Matson Navigation Company, assuming the position left vacant by the retirement of Joe Barker. Wolters was assistant port engineer under Barker for many years. He assumed his new duties on May 3 and has been in the Matson Line service since July 25, 1918. Mr. and Mrs. Wolters returned from



Chief Engineer Charles Kuhn, left, Guatemala, center, and chief steward Harry Moore of the Panama Mail liner Colombia, interested in a late copy of Pacific Marine Review. Guatemala is said to be the most talkative parrot afloat.

Honolulu aboard the Malolo on May 2.

Edward J. Mooney, chief engineer of the Matsonia for several years, has succeeded Henry Wolters to the post of assistant port engineer. He joined the Matson service on September 21, 1921, as chief engineer of the steamer Lurline.

H. T. Keene, first assistant engineer of the liner Malolo since her maiden voyage last November, and before that chief engineer of the steamer Manukai, was promoted to chief engineer of the Matsonia to succeed E. J. Mooney, now assistant port engineer.

Other Matson Navigation Company personnel changes are: **Glen Kelly**, formerly of the purser's office on the Malolo, to freight clerk of the Matsonia; **Ernest Ransome**, ex-purser of the Lurline, and later baggage clerk of the Malolo, to freight clerk of the Maui; **George de Beaumont**, former freight clerk of the Sonoma, to duty in the main passenger department, San Francisco.

F. A. Bailey has been appointed to the post of vice-president of the Oceanic and Oriental Navigation Company, and Sidney G. Walton has succeeded him as secretary of the corporation.

Marine engineer to navigator is the role **Vincent Jarvis** is assuming as the result of someone telling him he was only a marine engineer and couldn't navigate a boat. He has started out to show them that he can, and to that end is the owner of a new 30-foot bird class yacht christened the Petrel. The vessel was recently launched from the bulkhead of pier 29, San Francisco. The Petrel was built by the United Engineering Company, San Francisco, and was christened by Miss Mario Silver, prominent yachtswoman, with a bottle of champagne. Jarvis is a member of the Corinthian Yacht Club.

Peter N. Anderson, retired chief engineer for the past four years, is deserting his ranch at Santa Rosa, California, for another touch of the salty air and the engine room. Unable to resist the call of the sea, Anderson, well known in every Pacific coast port, has taken the post as first assistant engineer of the Edna Christensen of which A. P. Costello is chief.

After a long spell at the San Francisco Marine Hospital, where he underwent treatment for injuries received in an automobile crash, **Martin Swift** has returned to sea as second assistant engineer of the W. R. Chamberlain Company's steamer Stanwood.

HAWAII

*in all the world few spots as lovely—
none so decidedly unusual*



PERHAPS you've seen the movie about the *Parsonage at Booter's*—perhaps you've toured the Corralito Coast—you've seen the glorious sunset at Anahulu. Each is distinct, but not more so than Waialeale with its whispering surf, or the majestic heights of the Pali, or the matchless views of Oahu, or the magic of the hula on a scented Hawaiian night.

Small wonder that sophisticated travelers who know what they want in pleasure and delightful companionship are seeking out Hawaii and its creature on the great sea Malolo. The Malolo has brought the Island Paradise within 3 days' of San Francisco.



The Malolo sails every other Saturday from San Francisco. One or more other Matson liners sail each week.

Captain Cook Sesqui-Centennial celebration, Honolulu, August 14 to 21. Pleasure pageants make old Hawaii live again.

Matson line
Hawaii • South Seas
Australia
415 MARKET STREET, SAN FRANCISCO



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the efficient vessel requires

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New—has fifteen new improved features including *Kentler*—both visual and oral bearings. It is an *Compass*—instrument of untiring precision for navigating in foggy weather. As sole agents we will gladly send you descriptive details.

Write to companies for details and prices. We are glad to provide this information without obligation.

MACKAY RADIO
& TELEGRAPH COMPANY

Hobart Building, San Francisco

Emil W. Allaf, first assistant engineer of the intercoastal freighter **Sidney M. Hauptman**, was shore-side for a round trip of the vessel in order to take the examinations for his chief engineer's ticket.

Bound for his boyhood home in Glasgow, **William J. Johnston**, for the last several years port engineer of the Mexican States Line, now out of business, has left San Francisco. Before leaving Johnston was presented with a beautiful watch and chain by his many friends in shipping circles.

Marine engineering circles are mourning the passing of **Irving W. Goodall** and **V. P. Moustakes**, active members of the American Society of Marine Engineers, who died recently. By resolution the organization expressed their sympathy and condolence to the bereaved relatives and friends.

To take the place of the steamer **Maunawili**, which vessel was laid up for repairs, the steamer **Maliko** which has been on spot for the **Matson Line** was again placed in commission. The engineer officers of the **Maliko** are **Joseph Barker, Jr.**, son of the recently retired port engineer of the **Matson Line**, who went out as chief engineer; **James Knox**, first assistant; **Bernard Baldwin**, second assistant; and **Jacob Akiona**, third assistant.

Changes in the engine room of the **Dollar liner President Wilson** previous to her recent sailing round the world were as follows: **A. K. Johnson**, promoted from first assistant to chief engineer, relieving **C. W. Irwin**, shoreside for one trip;



E. A. "Daddy" Hawes, who has been a chief steward for the past fifty years, and is still going strong in that capacity on the **Dollar liner President Harrison**.

Hugh Donahey joined the vessel as first assistant; **James Lally** was promoted to engine room second replacing **John Quinn**, also remaining shoreside; **Ole T. Vind** was promoted to third assistant; and **Frank Sofsky**, **Charles Seaton**, and **Thomas Wood** were appointed junior engineers.

New boilers were recently installed in the **Sudden & Christensen** steam schooner **Chehalis** by the **Eureka Boiler Works**. Following the installation the vessel returned to the coastwise lumber trade.

Twenty-six diesel powered vessels with an aggregate deadweight tonnage of 250,000 are operated by the **Wilhelmsen Line**, of Oslo. This is

the largest fleet of motorships operated by one company in the world. The first entered service in 1921.

For the first time in the history of **Grays Harbor** a 15,000-ton steamship entered the harbor when the freighter **Robert Dollar** of the **Canadian-American Shipping Company** successfully negotiated the passage without difficulty on her voyage north to Seattle to enter the service of her new owners. The vessel's name is to be changed to **Chief Capilano** in conformity with the company's policy of operating its ships under the name of the **Chief Line**.

The **Montauk** and **Montana**, 12,000-ton freighters, have been chartered by the **American Mail Line** from the **International Mercantile Marine Company** for addition to the **Mail Line's** transpacific fleet.

P. A. S. Franklin, president of the **International Mercantile Marine Company**, has started a drive for a revision of existing **Panama Canal** tolls. He said that the new liner **California** had to pay a toll of \$14,918.75 on a **Panama Canal** net tonnage measurement of 17,565 tons, and a **United States** net register of 11,935 tons. **Franklin** contends that this charge is inordinately high and that a reasonable maximum should be charged. He points out that **Suez Canal** tolls were ordered reduced on April 1. The Governor of the **Panama Canal Zone** has recommended a reduction from \$1.20 per net ton, the present rate, to \$1 per net ton; and from 72 to 60 cents per net ton for vessels in ballast. Elimination of the duplicate system of measurement has also been advocated.

During the visit to the **Pacific Coast** of **Lewis Luckenbach**, vice-president of the **Luckenbach Line**, he inspected numerous sites at **Los Angeles**, **San Francisco**, **Oakland**, **Portland**, **Seattle**, and **Tacoma**, for the possible erection of warehouses for the **Luckenbach Terminals, Inc.**

While there was no definite announcement made, it was reliably stated that this project would be decided upon sometime this month, following the report of **Mr. Luckenbach** upon his return to **New York** at the next meeting of the board of directors.

William G. Fitch, who opened the first passenger offices in **San Francisco** for the **United States Lines** and after several years was trans-



Merrill Johnson, at left, port engineer for the **Panama Mail Steamship Company**, and **Frank Fox** (center) of the **General Engineering Company** listening to Chief Engineer **Sykes** spring a Scotch joke.

ferred to Cleveland for the government passenger business, is once again assigned to handle the Pacific Coast passenger business for the United States Lines. It was believed that **Harry E. Perkins**, formerly of the Los Angeles headquarters would remain as head of this territory, but an order sending Fitch to assume his old duties was issued, and he is now again in charge of the West Coast offices. Perkins returned to his old berth at Los Angeles. The change was brought about by the recent passing of Mose H. Hunt.

Marine engineers at San Diego, Los Angeles, and San Francisco tendered a "home-coming" dinner at the three ports to **Ernest F. Prince**, upon his first trip to the Pacific Coast as chief engineer aboard the Panama Pacific liner California. He was formerly on the company's liner Mongolia. Relieved of this berth, he supervised the installation of engines on the California and then continued as "major domo" in the work of directing the installation of engines and other fundamentals below deck on the liner Virginia, sister-ship of the California.

Prince will remain on the California, watching the performance of the electrically-driven coast to coast liner, while **John Carstairs**, formerly head of the California's engineering department, "stands by" the Virginia to supervise installation of her propulsion system.

After serving as general freight agent at Los Angeles for the California & Eastern Steamship Company for more than three years, **Ralph Burger**, widely-known in Pacific Coast freight traffic circles, is now maintaining the same position for the company in San Francisco.

"Clicking off knots better than ever" was the report of Chief Engineer "**Andy**" Wishart of the Admiral Line's crack coastwise liner **H. F. Alexander**, following the return of the fast turbiner into service after five months overhauling at the Bethlehem Shipbuilding Corporation. The overhauling of this fast greyhound that serves the passenger trade up and down the Pacific Coast was one of the major reconditioning jobs of the present year.

George Scales, shipowner and agent for the Clan Line in New



Officers of the liner Wilhelmnia in their white uniforms: Left to right: W. Curtin, second steward; F. Anderson, chief steward; O. Bergman, chief officer; Mrs. Josephine Monahan, stewardess; J. B. Blain, third officer; H. J. Costello, second officer; Capt. K. Hubbenette, master; J. T. Anderson, chief engineer; C. F. Hewins, doctor; Radio Operator Loewen; Arthur W. Baxter, purser; H. B. Crites, assistant freight clerk; G. T. Glass, freight clerk.

Zealand, arrived at San Francisco recently aboard the Union Steamship Company's liner Tahiti, for an extensive survey of maritime conditions in the United States. He expects to leave New York the middle of this month for England before returning home.

With the placing in service between New York and South America of three new 15,000-ton, 16½-knot motorships of the latest type by W. R. Grace & Company, the first of which, the Santa Maria cleared from New York recently on her initial voyage, it is interesting to note that this large American steamship organization, which also includes banking, coffee and other industries in its business, was founded by an immigrant boy who ran away from his home in Ireland

to ship before the mast as a green hand.

William R. Grace was born in Queen's County, Ireland, in 1840. At 14 years of age, he severed home ties and shipped on a sailing vessel for New York. After making numerous voyages young Grace settled in Peru where he opened a small merchandising store to supply ships. Ill health forced him to return to the United States. Making his headquarters in New York he became an American citizen. Then he started the operation of a small sailing fleet. During this time he also entered politics. Business developed under his keen direction and the fleet of ships between the Atlantic seaboard and South American ports increased. When the sailing ships started to disappear from the commerce marts of the sea, the W. R. Grace Line was one of the first to secure steamers. The growth of the company has been steady, and today it is one of the best known American steamship lines.



Ernest F. Prince, chief engineer, Panama Pacific liner California.

Lord Klysant, head of the largest ship-owning combination in the world, with headquarters at London, has bought the Australian Government's fleet of five passenger vessels and two cargo boats for \$9,500,000. The five liners are 13,000 tons each and the two cargo boats 9500 tons. They have been sold because Australia's experience in running a State-owned fleet has been as disastrous as that of some other countries which have made the experiment. The Australian Government ships were operated under the house flag of the Commonwealth Line. Lord Klysant, purchaser, is chairman or director of

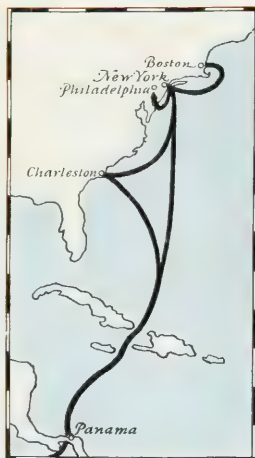
Pacific Marine Review

The National Magazine of Shipping

JULY, 1928



Meeting the
transportation
needs of the
Atlantic
and Pacific
Seaboards
through the
Panama Canal



The reliability of the American-Hawaiian Steamship Company—the Panama Canal Line—has become traditional in the Coast-to-Coast trade. One ship sails East and one sails West every 4 days in this



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"Coast-to-Coast since 1855"



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We predict that it augurs a most prosperous era for shipbuilding in the United States.

We are glad that it is our good fortune to get in the field with our new Johnson Type of Electric STEEROMOTOR in time to serve Shipbuilding needs growing out of the enactment of this constructive measure.

The cut shows the STEEROMOTOR we recently installed on the M.S. BENSON FORD for the Ford Motor Company.

Simple — Dependable — Efficient — Quiet

Best for steam or electrically operated ships.

Will straighten the course and better the speed of your ships.

When considering steerers let us tell you about the

Johnson Type Steeromotor

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Pacific Marine Review

The National Magazine of Shipping



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Pacific American Steamship
Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

Brighter Shipbuilding Prospects

Shipping Board and Postmaster General Apply Favorable Loan and Mail Subvention Provisions of New Merchant Marine Act to Produce Faster and Better American Ships

AFTER many lean years, the shipbuilding industry of America, facing practical starvation, is now about to be rescued from its perilous situation and can look forward with renewed hope to a more comfortable future.

Favorable loans and mail subvention given to ship owners under the Merchant Marine Act, 1928, will enable these interests to start in American yards a large program of combined passenger and cargo liner construction. It is too early to state positively to just what extent this initial program will reach. It is, however, certain that several large orders will be forthcoming within the next two years. Both the Postmaster General and the Shipping Board are taking the attitude that the loan fund and the mail subvention awards should be used as far as possible to promote the building of larger and faster ships than those now operating on the route served.

At the present time there are fairly definite assurances that five New York firms are planning the construction of 14 vessels with an aggregate construction cost of approximately fifty-five million dollars, and that two San Francisco firms plan the construction of 8 vessels with an aggregate cost of approximately \$45,000,000. Other Pacific Coast interests are actively figuring on 12 combined freight and passenger vessels to cost approximately \$50,000,000.

These are encouraging figures for shipbuilders to ponder over. The best part of the picture is that the loan fund which makes this program a practical working proposition is a self-perpetuating fund.

This fund being available also for betterments and the installation of modern and more economical propulsion plants presents an opportunity for a tremendous conversion program. In this connection it would be well for the engineers of all shipbuilding plants to familiarize themselves not only with the "dope" on conversion to the various forms of diesel drive, but

also with the possibilities in conversion to more economical forms of steam drive. We can learn much from Europe on both types of conversion.

There are some eight commercial shipyards in the United States capable of building the class of liners required to complete this program. Three of these are on the Pacific Coast. It would therefore seem reasonable, since a large proportion of the prospective program originates on the Pacific Coast and will be in Pacific port services, that Pacific Coast shipyards should get their share of this ship construction.

We heartily endorse the following editorial printed in the San Francisco Bulletin of June 27, under the heading "Build New Ships Here."

"The Jones-White merchant marine bill is law. America will have new ocean liners, and the Pacific, meaning San Francisco, will get its share.

Now arises the question of where these liners shall be constructed. Should not ships for the Pacific be built upon the Pacific, also meaning San Francisco?

Local shipbuilders are already laying plans to bring those contracts home. It appears that the two \$5,000,000 steamships which the Matson Navigation Company proposes to construct for Australian service will probably be launched on San Francisco bay.

But nothing has been said about the other jobs, the jobs which are added up variously to \$40,000,000 and \$55,000,000 worth of construction for the Pacific.

The very fact of the ships means new riches for the Golden Gate. What one new liner means is exemplified by the Malolo, which opened a new era in Pacific transportation with a four-day schedule to Honolulu. The Malolo cost \$7,500,000, which went to a shipyard in Philadelphia because the eastern shipbuilding concern made the lowest bid for the contract.

As the Chamber of Commerce magazine, San Francisco Business, points out:

Commercial Aviation

LATE in May there was opened between San Francisco and Los Angeles the de luxe passenger service of the Western Air Express, Incorporated. Three triple motored Fokker monoplanes were supplied for this service by the Daniel Guggenheim Fund for the Promotion of Aeronautics. These planes were designed by Anthony Fokker and built under his supervision at the plant of the Atlantic Aircraft Corporation and are said to be the most luxurious and fastest passenger planes yet constructed.

Three Wasp motors are used, each developing 425-horsepower, or a total of 1275 horsepower for the plane. On tests these planes developed 150 miles an hour and a sustained cruising speed of 120 miles an hour. Any two motors will maintain the cruising speed and any one motor will sustain the ship in flight at 80 to 90 miles an hour.

The pilot cabin provides facilities for two pilots with dual control. The passenger cabin has luxurious Pullman reclining chairs for 12 passengers, with windows stretching the full length of the cabin, providing ample view of all passing scenery. Astern of the cabin there is a fully equipped comfort room, with running water, and all conveniences. Further astern is a baggage compartment, with a weight capacity of 2000 pounds.

Western Air Express was chosen as a medium for the demonstration of this type of passenger air service because of its remarkable record in safe handling of mail and passengers on the route between Los Angeles and Salt Lake City. This record covered more than a million miles of flying without the loss of a pilot, a passenger, or an ounce of mail, and without wrecking a plane.

The new de luxe passenger service will maintain a schedule time of three hours between the Los Angeles Air Port and Mills Field, San Francisco.

Experiments are being made frequently on the problem of speeding up steamship passenger schedules and connections through the use of the airplane as an auxiliary. The most recent of these, and one that promises to make good, is the White Star Line direct connection between Cherbourg and Paris by airplane, saving some five hours over train time at very reasonable expense.

On June 30 Detroit played host to the greatest concentration of commercial aircraft ever assembled. This was the Detroit Air Olympics held at the Ford Air Port on that date. Part of the program of this meeting is a 6000-mile national air tour from Detroit to the Pacific Coast and return, visiting thirty-two cities en route. Twenty-five ships are entered for this event. They will be in San Diego, July 10-12; Los Angeles, July 12-14; San Francisco, July 14-16; Portland, July 16-18; and Tacoma, July 18-19.

There are approximately 4500 commercial aircraft owners in the United States, and 600 of these were expected to attend this meeting.

Captain Samuel Steele Sandberg

By W. C. Bunner

NOW that he has been exalted to the proud position of a member of the United States Shipping Board, about the highest gift our federal government could confer upon a master mariner, no doubt the

bureaucrats of Washington, D.C., will address him as "Mr. Commissioner." But on the Pacific side of the continent Samuel Steele Sandberg will always be hailed most cheerfully as Captain Sandberg.

Incidentally that same salutation would be just as cheerfully received in the little British colony on the opposite side of the Pacific where reside many of his staunch friends of twenty years ago. In fact it is precisely twenty years ago—1908—that I recall sitting with a group of old-time shipping men on the verandah of the Hong Kong Club, the one facing the harbor, waiting to see Captain do a speed/stunt with the Korea, of the Pacific Mail Company's fleet, 1900 881.

"Beau Brummel" of the Big Four fleet Captain Sandberg was called in those lively days of transpacific trade, a fanciful title which seemed to fit the man both physically and socially, for there was no better "mixer" in the Pacific Mail service either afloat or ashore. That usually solemn-faced ship's surgeon, Dr. Harry Gates, a comedian in disguise, once declared that the Creator made Sandberg's physical form something on which to drape a navy blue uniform. That last may sound a bit like "flattery," but "Big Bill" Ashman, who had tried to qualify for the title, had to admit that the decision was quite just; Captain "King" Zeeder of the Siberia to the contrary notwithstanding.

R. Stanley Dollar, vice-president and general manager of the Dollar Steamship Company, immediately the news of Captain Sandberg's appointment was made public, invited about a hundred of San Francisco's prominent merchants and shipping men to meet and congratulate the new member of the Shipping Board at luncheon at the Palace Hotel. Many speeches were made on that occasion, some of them spiced with well-worded welcome to the guest of the occasion, and I voiced the one prevailing opinion that the government had made a wise selection.

However, some of the unsophisticated must have felt a bit surprised when they heard their honored guest deliver himself of the following remarks:

"Although I realize how great an honor the Federal government has conferred upon me, I believe that that same government should lose no time in getting out of the ship-owning and ship-operating business. I pretty well know the needs of the Pacific Coast in a maritime way, and you may rest assured that I shall forever keep my mind on the needs of California's 10

One of the guests at that luncheon, himself an old-time transpacific skipper, insists that Captain Sandberg hesitated for some seconds in the very midst of his speech because he caught sight of Manager Halsey Manwaring standing at the main door of the banquet room. Very likely that old shipmaster was right when he thought Captain Sandberg hesitated, for the sight of that old-time manager of what was once the best foreign hotel in Japan must have been rather startling and most decidedly reminiscent of the days when he had frequently made the Grand at Yokohama his first stepping stone in many a pleasant voyage across the Pacific.

Who ever knew of one of the old guard of transpacific commanders giving up that coveted service without a severe tug at his heart strings? It was Chief engineer Dalzell of the old Occidental and Oriental Line who pronounced that service the aristocracy of the merchant marine of all the world, and published that opinion in one of his English magazine stories.

consequence, the tendency will be to construct large cargo liners to secure this most beneficent aid. Under the stimulus of this act, the tendency will be to supply the type of ship in which our merchant marine is deficient; namely, the fast combination freight and passenger steamer. From the governmental standpoint, this form of construction is especially desirable because it is bound to build up a huge fleet of vessels that will be excellent naval auxiliaries for use in time of emergency.

It is true that some cargo vessels on special routes not served by fast passenger-carrying vessels may derive some benefit from this ocean mail fund; but, in the main, this aid will, in practise, be applied chiefly to the fast combination freight and passenger steamer. Consequently, the cargo steamer derives little aid from the Merchant Marine Act of 1928 outside of the saving in interest from the construction loan fund.

Insurance Fund

The subject of the extension of the Shipping Board's insurance activities is a highly controversial one and, unquestionably, will receive further consideration by Congress. It may be said that this question is far from being settled and marine underwriters are disposed to challenge any further extension of the Board's activities along this line. There is little doubt but that further hearings will be held by Congress, in which event there is an excellent background in the outstanding investigations of marine insurance by the House Committee on Merchant Marine and Fisheries in 1920.

General Effect of the Law

While it is true that the fast passenger steamer is favored largely by the Jones-White Bill, nevertheless, the combined effect of the construction loan aid and ocean mail payments will, undoubtedly, result in increasing applications for the sale of the remaining Shipping Board lines with a tendency, after the purchase of the lines, to replace the war-built vessels with fast combination cargo-passenger liners. Such a result will be highly beneficial in that it will reduce govern-

ment operation, as provided in the Act, and will supply fine naval auxiliaries. Furthermore, it will build up, under the American flag, a great fleet of fast steamers which recent developments in trade make imperatively necessary if we are to hold our place in world competition. We have a clear indication of this principle in the remarkable bids that were made for the American West African Line which was sold by the Shipping Board subsequent to the passage of the Act. The many bids were evidently inspired by the liberal provisions of the Jones-White Bill and resulted in the award of the service to the Barber Steamship Lines at a price of \$2,343,506.80, or \$27.15 a ton; the highest offer yet made for Shipping Board vessels under recent conditions. Such activity promises great hope for the future.

New Construction

Since the passage of the Act, the press has carried many articles speculating on new construction both on the Atlantic and Pacific Coasts. While there have been few authoritative announcements, nevertheless, it is generally understood that the following companies will construct steamers as indicated: Ward Line, 2; W. R. Grace Co., 2; Colombian Steamship Line, 3; Export Steamship Line, 4; Moore and McCormack, 3. According to Henry Herberman, president of the Export line, their proposed steamers will be 14-knot freight and passenger vessels of 9500 tons deadweight, with 500 tons refrigerator space and accommodations for 100 passengers. The proposed vessels of the Colombian Steamship Line will be combination freight and passenger steamers with a speed of 16 knots, 500 tons refrigerator space, and accommodations for 110 first class passengers and 20 second class passengers. The Atlantic Ocean trade will benefit also by the five steamers that it is understood that the Dollar Steamship Line intends to construct under the provisions of the Act.

The Jones-White Bill was enthusiastically endorsed by shipowners, and there was great elation upon its passage. It is true that it does not cure all the ills

(Continued on Page 295)

COMPENSATION FOR CARRYING MAILS.

ACCORDING TO JONES-WHITE SHIPPING BILL S-744

	FROM NEW YORK TO	Direct Route in Nautical Miles	CLASS 1 Not less than 20,000 Gr. Tons 24 knots speed Rate per ton = 12.50	CLASS 2 Not less than 15,000 Gr. Tons 20 knots speed Rate per ton = 10.50	CLASS 3 Not less than 12,000 Gr. Tons 18 knots speed Rate per ton = 8.50	CLASS 4 Not less than 10,000 Gr. Tons 16 knots speed Rate per ton = 6.50	CLASS 5 Not less than 8,000 Gr. Tons 15 knots speed Rate per ton = 4.50	CLASS 6 Not less than 6,000 Gr. Tons 10 knots speed Rate per ton = 2.50	CLASS 7 Not less than 2,500 Gr. Tons 10 knots speed Rate per ton = 1.50
1	Plymouth	3033	\$ 36,396.	\$ 30,330.	\$ 24,264.	\$ 18,198.	\$ 12,132.	\$ 7,582.	\$ 4,549.
2	London	3341	\$ 40,092.	\$ 33,410.	\$ 26,728.	\$ 20,046.	\$ 13,364.	\$ 8,352.	\$ 5,011.
3	Le Havre (direct)	3192	\$ 38,304.	\$ 31,920.	\$ 25,536.	\$ 19,152.	\$ 12,768.	\$ 7,980.	\$ 4,788.
4	Le Havre (Plymouth)	3207	\$ 38,484.	\$ 32,070.	\$ 25,656.	\$ 19,242.	\$ 12,828.	\$ 8,017.	\$ 4,810.
5	Cherbourg	3125	\$ 37,500.	\$ 31,250.	\$ 25,000.	\$ 18,750.	\$ 12,500.	\$ 7,812.	\$ 4,687.
6	Copenhagen	3675	\$ 44,100.	\$ 36,750.	\$ 29,400.	\$ 22,650.	\$ 14,700.	\$ 9,187.	\$ 5,512.
7	Hamburg	3648	\$ 43,776.	\$ 36,480.	\$ 29,184.	\$ 22,688.	\$ 14,592.	\$ 9,120.	\$ 5,472.
8	Marseilles	3895	\$ 46,740.	\$ 38,950.	\$ 31,160.	\$ 23,370.	\$ 15,580.	\$ 9,737.	\$ 5,842.
9	Genoa	4060	\$ 48,720.	\$ 40,600.	\$ 32,480.	\$ 24,360.	\$ 16,240.	\$ 10,150.	\$ 6,090.
10	Alexandria	5017	\$ 60,204.	\$ 50,170.	\$ 40,136.	\$ 30,102.	\$ 20,068.	\$ 12,542.	\$ 7,525.
11	Constantinople	5026	\$ 60,312.	\$ 50,260.	\$ 40,208.	\$ 30,156.	\$ 20,104.	\$ 12,555.	\$ 7,539.
12	Capetown	6786	\$ 81,432.	\$ 67,860.	\$ 54,288.	\$ 40,716.	\$ 27,144.	\$ 16,965.	\$ 10,178.
13	Madras	9193	\$ 110,376.	\$ 91,980.	\$ 73,584.	\$ 55,188.	\$ 36,792.	\$ 22,995.	\$ 13,797.
14	Bombay	8174	\$ 98,088.	\$ 81,740.	\$ 65,392.	\$ 49,044.	\$ 32,696.	\$ 20,435.	\$ 12,261.
15	Calcutta	9816	\$ 117,792.	\$ 98,160.	\$ 78,528.	\$ 58,896.	\$ 39,264.	\$ 24,540.	\$ 14,724.
16	Colombo (Ceylon)	8607	\$ 103,284.	\$ 86,070.	\$ 68,856.	\$ 51,642.	\$ 34,428.	\$ 21,517.	\$ 12,910.
17	Singapore	10154	\$ 121,848.	\$ 101,540.	\$ 81,232.	\$ 60,924.	\$ 40,616.	\$ 25,385.	\$ 15,231.
18	Batavia (Netherlands)	8295	\$ 99,540.	\$ 82,950.	\$ 66,360.	\$ 49,770.	\$ 33,180.	\$ 20,737.	\$ 12,442.

[illegible]

On January 2, 1951, the attorney general, with the advice and approval of the Attorney General's Committee on Administration and Management, announced that the Administrative Conference would study the use of a questionnaire that proposed certain questions of this Act to all states by a uniform questionnaire. The purpose of the study was to determine what a questionnaire of this type would require and what states would be able to answer. The study committee consisted of the Attorney General, the Attorney General's Committee on Administration and Management, and the Administrative Conference. The study committee reported to the Attorney General on January 10, 1951, and the Attorney General's Committee on Administration and Management reported to the Attorney General on January 11, 1951. The study committee also reported to the Administrative Conference on January 11, 1951. The study committee's report was published in the *Administrative Conference Proceedings*, Vol. 1, No. 1, 1951, pp. 1-10. The study committee's report was also published in the *Administrative Conference Proceedings*, Vol. 1, No. 1, 1951, pp. 1-10. The study committee's report was also published in the *Administrative Conference Proceedings*, Vol. 1, No. 1, 1951, pp. 1-10.

If there is a common property that the two sets and domains for the two languages share, then the two languages have a common domain. In the present case, the two languages share the property that the two domains of the full set are composed of the same set of elements, although the two sets are not the same. The two languages share the property that the two domains are composed of the same set of elements, although the two sets are not the same. The two languages share the property that the two domains are composed of the same set of elements, although the two sets are not the same. The two languages share the property that the two domains are composed of the same set of elements, although the two sets are not the same.

Dep. Sec. of Commerce to the United States, 1000
S. Street, Bldg. 2000, Manila, and to New Orleans
to Australia and New Zealand.

The first of these routes is covered by Dollar Steamship services, and R. Stanley Dollar, operating head of the service, is now in preliminary negotiations for a mail contract under the Merchant Marine Act, 1928. Should he be successful his company will build at least three, and probably five, new combination passenger and freight liners. These vessels will be at least 12,000 tons gross and have a minimum sea speed of 18 knots. They will probably cost about \$6,000,000 each.

The second route mentioned above is covered by the Oceanic Line of the Matson Navigation Company, and Matson representatives are now in Washington negotiating for a mail contract. They also will have to build three liners to meet the requirements of the Act, and these vessels will be in the 18-knot, 12,000-ton class, costing about \$6,000,000 each.

These two programs of expansion are practically certain of fulfillment. The financial standing of the corporations involved and the long participation of Pacific Coast enterprise and capital in these steamship routes are a guarantee that, with any reasonable encouragement, they will be held by the American flag, shipping under private operation.

Two other services that will be favorably affected are:

(1) The San Francisco to West Central American ports service, and

The third of these is best illustrated by the testimony of James M. Cox, who, after being arrested and charged in the general course of the trials, stated calmly and unhesitatingly, even in the most incriminating context, the non-influence and non-use of force against his own grandfather and uncle, as being evidence he had granted his own father and brother-in-law to be American agents.

On the morning of June 17, 1946, West Coast of Mexico, American Travel, would make its 10th anniversary. It had been a good business, with growing sales. But it had been a hard business. From the Yucatán to the Gulf, one way at Callao and leaving coastwise feeder service to the cities and towns in the same neighborhood. The service is not limited to the cruise line with regular stop-over changing Round Trippers. They have a regular passenger line, and particularly on the West Coast of South America, and particularly that way they come and back through on the present coast service.

There is that through the Panama Canal to Europe. Here we find no regular freight and passenger service under the American flag, although for some years the eyes of the shipping world have been focused on the amazing growth of European lines in this service. The most outstanding activity now in evidence among European ship operators is in establishing lines of direct water transport between the principal ports of western Europe and Pacific Coast ports of North America. Many large fast combination passenger and freight steamers are being built for this purpose. Of serving this route, notable examples are the Hamburg-American Pacific line motorships, the North German Lloyd steamers, the Furness-Pacific, Ltd., steamers and motorships, the Johnson Line motorships, the Holland-America Line motorships and steamers and the Norway Pacific Line motorships.

It seems as if all Europe is in a race to build new and larger vessels for this service. The French Line with a steamer service now on, is building three 15,000-ton fast motorships to supplant its steamers; the Donaldson Line has two fast refrigerator carriers on the stocks, to be followed by two more; Furness-Withy is still expanding its services; the Norway Pacific Line is building two more motorships.

Shipping Board Commissioner Myers is enthusiastically endorsing the establishment of a line of fast combined passenger and freight liners for this service, and is reported as favoring the extension of both the loan privilege and the mail subvention to new ships operating under the American flag on this route. Capital is said to be available in California for this project, which would mean the building of six vessels costing at least \$4,000,000 each. These six vessels are not nearly so certain as the others mentioned. The foreign competitors on this route (notably the French and Italian) are aided in various ways by their governments. The route is not a direct mail route and any mail subvention would therefore be open to much criticism and political pressure.

We conclude then that from the ship operating and ship building viewpoints, much benefit will come directly to Pacific Ocean shipping. A shipbuilding program aggregating about \$40,000,000 is reasonably sure to be started within the next two years. An additional \$25,000,000 program for new ships is a probability but not so certain. A large conversion program running into millions is very probable. The speeding up of direct American services with the Orient and Antipodes is certain and that will bring in its wake an increase in American trade, prestige, and passenger travel.

President Rodger Lapham of the American-Hawaiian Steamship Company, oldest and largest of the American intercoastal services, and now directly interested in foreign trade through association with Matson in the Oriental and Occidental Navigation Company, says of this legislation:

"Now that the Jones-White bill has been signed by the President, shipowners and others are wondering just what its effect will be. Its main features are the construction loan fund and the mail contract provisions. The former, providing easy money and terms, would not of itself start shipbuilding on any large scale were it not coupled with the mail contract feature. However, it is too early to predict how far shipowners will avail themselves of the opportunity offered. The measure of any mail aid is in the last analysis left largely to the Postmaster-General and the Shipping Board. Inasmuch as the passage of the bill developed no partisan opposition, it seems fair to assume that the wish of Congress and the country at large is to encourage the development of the American merchant marine in foreign trade and under private ownership.

"With that general sentiment so apparent, it is expected that the Postmaster-General and the Shipping Board will do all they legally can to accord the shipowner the most favorable treatment and encouragement in the hope that the purposes of the bill will be attained.

"The bill is a compromise. In many ways it strengthens the power of the Shipping Board. The provision forbidding the sale of any vessel or line except upon the affirmative vote of five of the seven members of the Board was not acceptable to the President. That provision makes it easier for the Board to keep the Government in business if its members are so inclined.

"Nevertheless, the bill is on the whole a step in the right direction. At any rate it behooves shipowning companies to sharpen their pencils and begin figuring to see whether the construction of new vessels will prove a reasonably profitable venture for their stockholders."

The indirect benefits of this legislation are important. In the campaign for the enactment of legislation beneficial to the American merchant marine, the American Pacific Coast shipping interests have taken a very prominent if not a leading part. This fact has drawn them together into a working unit of great power and prestige at Washington. The Jones-White Bill is looked upon by this unit as a compromise. It is a long step in the right direction, but it has by no means reached the desired end. There is much yet to be done before American shipping is firmly established for its freedom of opportunity on the high seas in foreign trade. Pacific American shipping interests are substantially agreed as to the further steps necessary and are greatly heartened by this partial victory to go forward to greater achievements.

Jones-White Bill and Atlantic Shipping

(Continued from Page 293)

of American shipping, but it is a big step in the right direction. These neglected factors in our shipping problem can be prosecuted further at future sessions of Congress. While there is scant comfort in the Act for the independent operator in the general cargo trade, nevertheless, great aid is extended to those who have bought, or are about to purchase, Shipping Board services. Chairman O'Connor was right when he said that this law would hasten the transfer of government-owned tonnage to private American hands for operation on a permanent basis and will safeguard routes already sold.

Although the bill was a compromise and much is still left to be done, instead of labeling it grudgingly as being a half-loaf and consequently better than none, we should join those who prefer to call it "the most constructive step taken in 50 years on behalf of the American merchant marine."



Famous Stars of the Pacific, I.

The Eventful Career of the Sailing Ship Star of Scotland, Formerly Kenilworth

By F. F. Matthews

THE famous star of the Pacific of Scotland was Kenilworth, and the following is a brief summary of her career. The ship was launched at Glasgow in 1851, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.

The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.

The saloon is fitted up with a cozy little fireplace takes the place of the old-fashioned stove, and the crew's quarters are also fitted up with a cozy little fireplace. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.

The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.



The Star of Scotland, formerly Kenilworth, at sea.

The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.

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The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific. The ship was built for the Pacific, and was the first of a class of ships built for the Pacific.

of very good runs: 200, 255, 303, and 320 miles. Crossed the line 23 days out and was making very good time until getting down to latitude 16 south, Captain McNair anticipating a fast passage to San Francisco. However, nothing but variable and unsteady winds and hard head gales were encountered during the rest of the run in the South Atlantic and the ship was not in the Straits of Le Maire until the 52nd day out. Bad weather continued until the latitude of 49 south, Pacific, was reached, the ship having been forced to the high latitude of 60 degrees. Captain McNair reported being 8 days making 280 miles in latitude 30 south and did not cross the line until the 97th day out. Thence to the Golden Gate he had 31 days, the winds being light and variable and the trades light and well from the northward.

Burning of the Kenilworth

Obtaining a wheat charter for Liverpool, the Kenilworth was loading at Port Costa, California, and had some 3000 tons on board, when on August 26, 1889, a fire broke out on shore, burned the warehouses to the ground and extended to the shipping. Tugs sent up from San Francisco and river steamers then in the vicinity saved the Kenilworth from total destruction, but the wooden ships Armenia and Honawaur were entirely destroyed. The Kenilworth, badly damaged, was sold at auction to Arthur Sewall & Co. of Bath, Maine, and San Francisco parties, and the purchasers had her reconstructed at the Union Iron Works, San Francisco, under the superintendence of surveyor I. E. Thayer and her to-be commander, Captain J. G. Baker. When rebuilt, Congress passed a bill giving her an American register and she continued under her original name.

Kenilworth's Fine Record Under the American Flag

The command of the reconstructed Kenilworth was given to Captain J. G. Baker of Boston, who had been master of the Sewall ship John Rosenfeld during her career and later of the ship Commodore operating on the Pacific Coast. The Kenilworth took her departure from San Francisco April 19, 1890, and crossed the equator 15½ days out. She passed Cape Horn on the 42nd day, and on her 67th day out was on the line in the Atlantic. Thereafter for 32 days she encountered generally light winds with many calms intervening. On July 27, 99

days out, she passed Kinsale and arrived at Liverpool two days later. Captain Baker wrote to friends in San Francisco that the ship worked well in every way and her cargo turned out in perfect condition.

Under command of Captain Baker the Kenilworth made four passages from New York to San Francisco in 116, 144, 115, and 118 days and one passage from New York to Astoria in 119 days. On the run of 144 days, in 1895, nothing but light winds prevailed throughout. In 1899 Captain Taylor was 103 days from New York to San Francisco in spite of an unusually rough passage around Cape Horn and considerable adverse winds and calms in southern latitudes. On July 30, 1893, the ship left New York for ports in China; called at Amoy, Shanghai, and Hong Kong, and was back in New York in exactly 10 months. Her time from Hong Kong to New York was 92 days.

Many of the homeward voyages of the Kenilworth were from the Hawaiian Islands to New York or Philadelphia with raw sugar. She was not prominent in the grain trade between Pacific ports and Europe, making, while an American ship, only some four voyages over that course. Her run of 111 days from Astoria to Cork in 1893 was the fastest made about that period, with the single exception of that of the Thessalus from San Francisco, 101 days. Homeward bound

from the Hawaiian Islands her fastest time was 93 days in 1895. The following year her time was 97 days and other runs she made over the course were 100 days, 111 days, and 111 days on a second occasion. Homeward bound from the Islands in 1898 she put into Valparaiso with her cargo on fire. After refitting she made the passage from the Chilean port to New York in 65 days, which is the record fast run for modern ships and one that has been beaten only by a small margin by any of the old extreme clippers.

Kenilworth Makes a Record Slow Passage

On August 15, 1906, the Kenilworth passed Delawater Breakwater bound from Philadelphia to San Francisco under command of Captain J. A. Amsbury, formerly in the Roanoke which had been burned at Noumea, New Caledonia. Off Cape Horn she was considerably damaged in heavy weather, part of her rigging being carried away as also her steering gear. Captain Amsbury put about and, on February 11, 1907, anchored at Montevideo. Repairs were made and the voyage was resumed April 4. But again she was damaged in heavy gales, besides which she could not be handled well on account of the large amount of marine growth attached to the hull. Captain Ams-

(Continued on Page 31, Adj. Section)



The ship Kenilworth on her beam ends in the South Atlantic.
Picture sent him by express to the Pacific Marine Review, San Francisco.

ber and on the labels were put forward to support that view; that the main damage was due to over-humid conditions in the holds of the vessel was also held to be a likely cause, but exactly how this could produce such rusting was difficult to explain. In order to make tin plate rust in the manner of the damaged tins it is necessary for actual beads of moisture to become deposited on it. It will not rust simply by being kept in humid air, unless temperature changes operate to cause the deposition of moisture upon it. The problem then was to investigate these moisture and temperature conditions on board ship in an endeavor to define the circumstances in which moisture from the incoming air could become deposited on the cargo. The records of this investigation, which was carried out on a summer voyage in 1926 to Vancouver, and a second summer voyage this year to New York, lead me to differentiate between three classes of condensation of moisture in the ship's hold, and to focus attention on the lag which exists between the temperature of cargo and the temperature of air and sea when the latter are changing fast. The three classes of condensation are as follow:—

(1) Moisture condenses on the ship's side while the cargo remains dry.

(2) Moisture condenses on the cargo while the ship's side remains dry.

(3) Moisture condenses on the under-side of the deck and hatch coamings and drips back on to cargo.

The circumstances in which each of these forms of condensation arises differ from each other; in addition the method of ventilation necessary to check the condensation depends on the particular form.

The principle underlying all investigations of this kind is that dew will form on any object if it is cold enough to be below the dew point of the air reaching it. An instance of this may be given from the occasional formation of dew on the deck of a vessel passing through tropical waters.

At mid-day, or soon after, the deck reaches a temperature of 120-125° F. As late afternoon approaches the deck cools fast, and by six o'clock it is colder by a few degrees than the air, for the air temperature has not fallen as fast as the deck. The deck reaches the nightly level of 82-83° before the air, and if the air on these occasions approaches saturation it becomes covered with dew. In what circumstances can such deposition of moisture take place in the ship's hold? To discover this we must look for temperature differences in the ship either between day and night or from day to day, which would cool some internal part of the ship or cargo sufficiently to cause moisture to condense out on it.

Sea Water Temperatures

The controlling factor in regulating the temperature of the lower holds of the ship is the temperature of the sea water. The hull of the vessel is immersed in the sea down to her marks and only half-an-inch of steel separates the hold space from the sea water. The steel is a good conductor and its temperature is that of the sea water, so that the "walls" of this "ware-house" are at the temperature of the sea water. The scrutiny of a typical record of the sea water temperatures on a voyage from the United Kingdom to Los Angeles through the Panama Canal discloses an absence of fluctuations that comes as a surprise to one accustomed to conditions on land. The best instance is in tropical seas, for instance, across the Caribbean Sea and into the Pacific Ocean. Here the temperature remained constant day and night

at 83 degrees Fahrenheit with a fluctuation of only + and —1 in the neighborhood of the land masses of Central America. The sea is a huge thermostat, so that goods in the lower holds are maintained at a constant temperature day and night while the vessel is in tropical waters.

On the voyage from England to the tropics, the sea water temperature rises gently and with regularity. There is a general upward trend due to the change in latitude, amounting to an average of 2.5 to 3 degrees Fahrenheit per day, and super-imposed upon this is a daily fluctuation of + or —1 due to the sun, being rather greater in higher latitudes than in lower. The changes in temperature in the lower hold due to the influence of sea water are consequently very gradual, and no large difference exists between the day and night temperatures of the sea water to produce periodic nightly saturation of the air in the hold. Sudden changes in the temperature of the sea water do, however, occur on the voyage, and these are due to ocean currents the approximate positions of which are known to the officers of the ship. For instance, the ship leaves the North Equatorial Current off the Gulf of California, sailing north to enter the cold Californian Current, and in consequence the temperature falls with great suddenness.

Air and Sea Temperatures

Turning now to the air temperatures, we shall not be surprised to find them rather more influenced by the succession of day and night than sea water temperatures are, but what is remarkable is the very close agreement between the shade temperature of the open air and the sea water temperature, throughout a long voyage. Usually the air and sea temperatures lie very close together indeed. There is the same gradual upward trend due to changes in latitude amounting to 2.5 to 3 degrees Fahrenheit per day until the tropical average of 83 degrees is established, and superimposed on this upward trend is the daily rise and fall. This daily periodic change is greatest in high latitudes. Thus in the North Atlantic in fine weather it amounts to + and —4 degrees Fahrenheit, while in the tropics it is nearer + or —1 degree Fahrenheit. At no time is the daily fluctuation of the air temperature at sea as great as it is on land. When the sea water temperature begins suddenly to fall on account of ocean currents, the air temperature falls with it, the sea temperature falling rather in advance of the air temperature.

The closeness of the shade temperature of the air to the sea water temperature is well illustrated by plotting one on the other and it will then be seen that the difference is never very great.

The significance of the shade temperature of the air lies in the fact that it is the temperature of the air entering the ship's ventilators. It is the air entering the cargo spaces. The holds of a cargo vessel are usually ventilated by cowl ventilators in groups of four, each serving all the holds within every two thwartship bulkheads. The weather ventilators are trimmed to back the wind and act as uptakes, and the lee ventilators are trimmed to catch the wind. At each successive deck the cylindrical sheet iron pipes which carry the air to and from the holds are cut short just below the deck and are continued down with a somewhat smaller diameter to the next lower deck. The annular space thus left provides a passage for the ventilating air to enter or leave the respective hold in the 'tween-deck. The air enters and leaves the ventilators with considerable speeds, and although these speeds are related to the speed of the ship and to the prevailing wind, in prac-

become saturated. As long as the temperature of the cans remains below the dew point of the ventilating air, as it very well may for a considerable period, the condensation of moisture upon it continues. The hold at this time appears on inspection to be quite dry because its sides are warm. The condensation takes place within the cases and is thus unobserved.

It will be noted that the conditions are now the reverse of those considered earlier. The ventilation requirements are also reversed. To ventilate a cold cargo (and especially to use forced ventilation with warm air), is to court trouble, for the dew point of the warm air is often not more than three or four degrees below the dry bulb temperature. The aim should be to seal the hold up before the rise in temperature sets in. If the ship enters the warm region with her cold cargo sealed up the cargo is safe; the ship's sides become warmer hourly and the decks, exposed to the sun and subject to the rise in atmospheric temperature, also get hot, and these act as warm radiators to the cold cargo. The relative humidity of the air in the holds falls as the external temperatures rise and the cargo consequently remains safe.

Cargo Temperature Lag

To what extent the temperature of the cargo lags behind that of the atmosphere and the sea-water when such a rise takes place is not known. I have begun investigations into this question in a short voyage to New York, in which I had the bulb of a mercury-in-steel long-distance recording thermometer sealed in a gallon can of water stowed with cargo in the lower hold of the vessel and recording in the upper 'tween deck.

The temperature conditions on the North Atlantic are entirely unlike those on a voyage towards low latitudes. Across the Western Ocean sea water temperatures fluctuate considerably on account of the contending influence of the Labrador and other Arctic currents setting westward and the waters of the Gulf Stream, which in these latitudes are still easily recognizable and exert a great influence on the temperatures of the sea water, although they no longer follow a well-defined course as they do in the thirties and forties. The vessel's track is across the northern edge of that part of the ocean within the influence of the Gulf Stream, and is constantly crossed by Arctic streams. The record of the temperature of the sea water on a North Atlantic voyage is consequently very irregular. However, the sudden entry into the Gulf Stream after a day's steaming from New York is well marked. On the voyage in which this experiment was carried out, the temperature of the sea water rose from 58 to 73 degrees in four hours, and while this high temperature level was not maintained, the influence of the gulf stream was felt for several days afterwards. The temperature of the can only gradually rose to that of the sea water, and when 70 hours later the vessel passed through cold water to re-enter Gulf Stream waters after 20 hours' steaming, the can hardly cooled at all. Indeed, the record of the temperature of the can shows a very smooth curve, not influenced by temporary fluctuations in the sea water temperature, but following its general trend after a time interval of something in the neighborhood of twelve hours.

On the occasion of the rise in temperature just referred to, the air temperature rose to 75 degrees, and for a few hours the dew point was above that of the cargo and the vessel's interior. As the rise set in the walls of the saloon and state rooms, where ports and doors were open, became heavily covered with moisture.

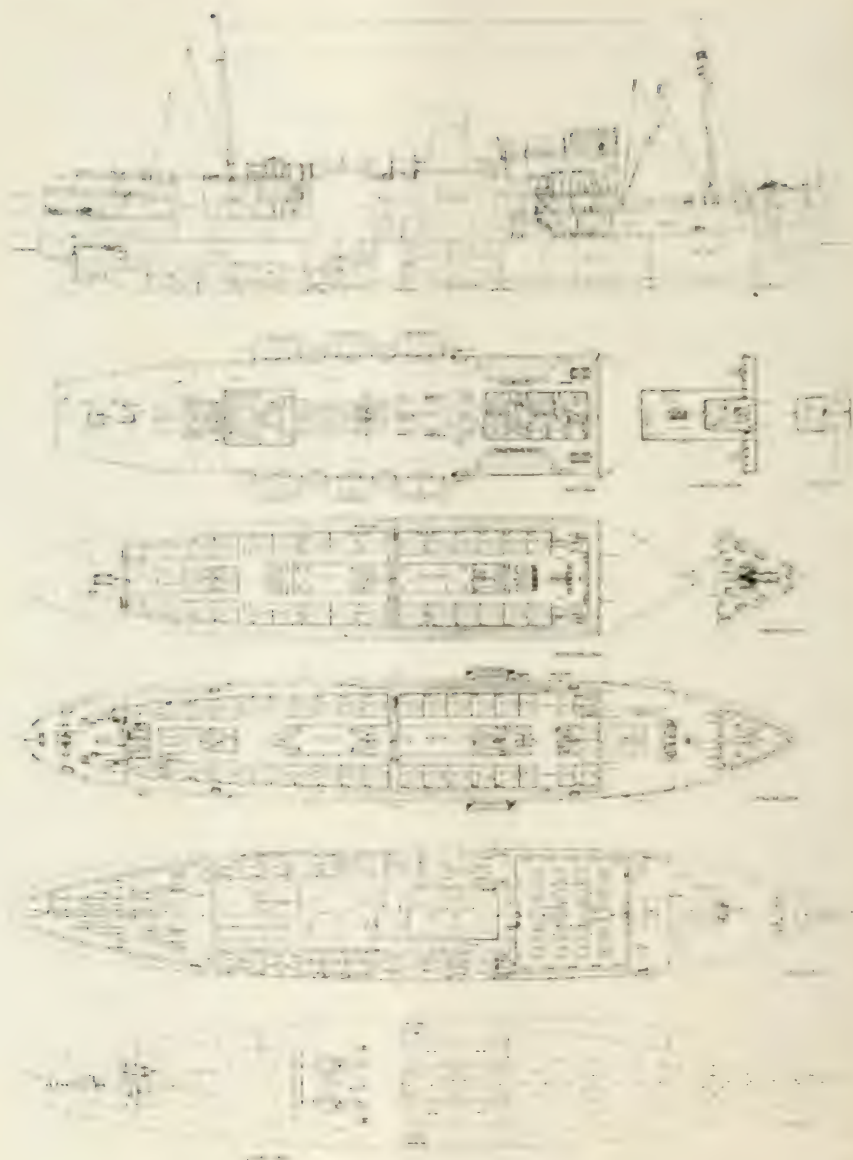
A word must be said with regard to the difference between air temperature and sea water temperatures on the North Atlantic. In these latitudes a change of wind results in a marked difference in air temperatures, and the close agreement existing between shade temperatures of the outside air and the sea water on such voyages as those to California, New Zealand, and South Africa does not exist. The voyage, however, across the North Atlantic is a short and cold one, and the humidity conditions which would damage cargo on a longer voyage are generally of too short duration to do harm. What experimental evidence there is, therefore of the lag between the temperature of the cargo when external conditions are rising and falling fast shows the lag to be real and measurable. The opposite phenomenon, namely, the cooling off of warm cargo, has been investigated more closely in connection with the carriage in refrigerated holds of fruit which has not been pre-cooled. It is well known that such fruit takes many days to reach the temperature at which it is to be carried.

Rule for Ventilation

The new proposal with regard to the ventilation of canned goods or metal cargoes, or of any cargoes which are themselves free from moisture, is, therefore, to restrict the ventilation drastically when temperatures are rising fast, and to do this prior to the rise, and to ventilate vigorously when temperatures are falling rapidly.

There remains the practical difficulty of modifying the ship's ventilators so that any cargo space can be ventilated or closed from the weather deck. As ventilators are now constructed it is only possible to exclude air to all levels simultaneously, and even then, in vessels with shelter decks, air would still enter through the annular spaces between the extensions of the ventilators and the ventilator coaming. In practice, a ventilator is closed by removing the cowl, plugging the coaming and securing the plug by covering it with tarpaulin, making it fast with rope. This is only carried out under stress of bad weather. To put into practice the method of ventilating now described, it is necessary to be able to close or open the ventilators to those particular holds alone in which canned goods or similar cargo is stowed. This is necessary in order to permit ventilation at the same time of a hold in which goods requiring permanent ventilation are stowed.

The third form which condensations presents is the precipitation of moisture on the under side of the weather deck, where it collects and drips back on to the cargo. This form of condensations has long been known, and it is commonest in cases where moisture is derived from cargo; earlier in this paper reference was made to the shrinkage in weight during the voyage of cargo apparently dry. It is not perhaps sufficiently appreciated that the temperatures in a lower hold are maintained at about 83 degrees or 84 degrees both day and night while the ship is in tropical waters, and this is a higher and more evenly maintained temperature level than that occurring on land in the temperate countries whence much produce containing moisture is derived. Consequently it must dry out. The compulsory closing of ventilators when such cargoes are carried, therefore, leads to a rapid increase in the absolute humidity of the confined air. The deck cools towards evening, and while dew may form on deck, condensation takes place beneath it. The danger is greatest when the general trend of temperatures is downwards, and the ventilators are closed on account of the weather, in accordance with the argument already set forth.



Inboard profile, deck and hold plans of the Inter-Island steamship Waialeale.



New Inter-Island Steamer Waialeale

Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., Delivers Modern Passenger and Freight Liner for Hawaiian Inter-Island Service

ON THE island of Kauai, of the Hawaiian group, there is a beautiful mountain peak covered with semi-tropical verdure, through which many streams of sparkling water rush merrily down to fall in flashing cascades over cliffs into the sea. Some happy Hawaiian poet long ago gave to this gem of mountains the beautiful name of Waialeale (Wy-ahlee-ahlee) which signifies the idea of rippling waters. The mountain in turn has given its poetic moniker to the new and beautiful passenger and freight steamer recently completed at San Francisco by the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., for the Inter-Island Steam Navigation Company of Honolulu.

A thorough-going example of good craftsmanship in the various departments of the shipbuilding art, shipshape from stem to stern, and full of life and power, the steamship Waialeale fully lives up to the traditions and reputation of the Union Plant and is a credit to her builders and to the marine engineers and naval architects of the Inter-Island Steam Navigation Company and the Matson Navigation Company, who supervised her design and construction.

When the steamship Waialeale had run her trials on San Fran-

INTER-ISLAND FLEET

The Inter-Island Steam Navigation Company of Honolulu, in addition to the steamship Waialeale, operates a large fleet including the following: steamers Haleakala, Mauna Kea, Kilauea, Kinau, Claudine, Like-like, Helene, Hawaii, Mauna Loa, Kaala, and motorships Lehua and Kailua.

cisco Bay and outside the heads and had tied up alongside one of the Matson piers at San Francisco for the finishing touches and final outfitting before her run over to Honolulu, she created a very favorable impression along the waterfront and among those who were privileged to look around aboard. Such expressions as "a pippin," "biggest little steamer I ever saw,"



Officials of the Inter-Island Steam Navigation Company on the boat deck of the Waialeale at San Francisco. G. M. Wilcox, president, center; Arthur H. Armitage, general manager, at right; and E. S. Swan, private secretary to President Wilcox, at left.



All cabin staterooms on the Waialeale feature Simmons comfortable beds. This view shows a first class room, with the Simmons Pullman berth folded up against the bulkhead.

the promenade and shelter decks. The majority of these rooms are equipped to take care of three passengers, being furnished with two Simmons metal beds and a Simmons Pullman berth. Running water, porcelain wash basin, electric fan, thermos bottle, dressing table, and settee are included in the equipment. A number of the staterooms have private toilets and showers. Stateroom bulkheads are Haskellite and all stateroom interiors are finished in white enamel, with which the mahogany finished metal furniture and dark carpets make a very pleasing contrast.

All steel decks in way of passenger accommodations are covered with Linatol furnished by Hill, Hubbell and Company, San Francisco.

Finest quality bed clothes are standard equipment on the steamers of the Inter-Island Steam Navigation Company, and on the Waialeale this equipment includes 100 dozen cotton sheets, 100 dozen cotton pillow slips, and 445 Satin spreads furnished by the Parker Wilder Company of New York. These Satin spreads are especially made for this job by the Monadnock Mills and are decorated with the insignia of the company woven into the center of each spread. The Cannon Mills, Inc. of New York furnished 290 dozen towels, and the Excelsior Quilting Company pro-

vided 20 dozen mattress protectors.

The wooden moldings and pillars in the staterooms, passageways, and public rooms are as nicely fitted a job of joiner work as we have seen on shipboard and are certainly a great credit to the builders.

Public rooms include the dining saloon, social hall, and smoking room; but we can imagine that

during Hawaiian inter-island voyages the most popular congregating spaces will be the wide stretches of beautiful teak floor under the awnings on the boat deck. The smoking room, furnished in natural teak, is erected on the boat deck, and light refreshments can be served from its counter.

Ample provision is made for ventilation and for insulating the passageways, public rooms, and staterooms from the heat of boiler and engine rooms. The Plant Rubber and Asbestos Company furnished and applied this insulation in the bulkheads between the fire and engine rooms and the quarters surrounding them. This was done so efficiently that none of the waste heat is allowed to escape to the staterooms and passageways. This is a very important factor for insuring comfortable living quarters aboard ship in tropical and semi-tropical climates.

The social hall, finished in white enamel with mahogany trim, is comfortably carpeted and furnished with upholstered wicker chairs and settees, a piano, victrola, and radio. The dining saloon seats a total of 95 persons, mostly at tables seating two and four, with one central table seating eleven. This room is located on the main deck and occupies the full width of the vessel, having attractive windows masking the port holes and a fine mahogany buffet decorated with a carved and colored medallion representing the



First-class stateroom featuring two Simmons beds and a Simmons Pullman berth lowered.

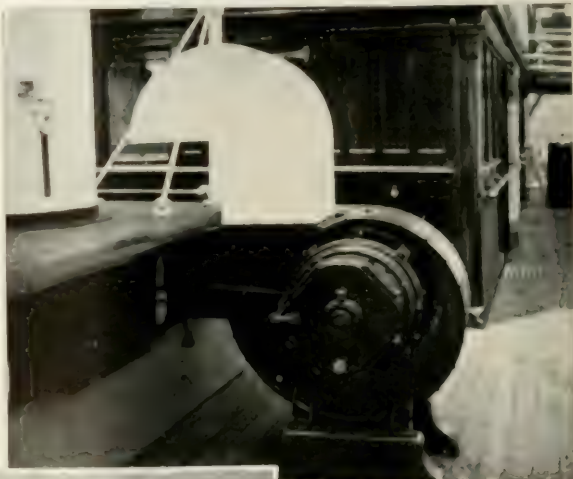


the entire unit of service. The floor is laid in polished mahogany and the ceiling is a very pleasing design. This fitting is used also in the stairs in combination with bright metal metal casing, giving a very rich and permanent floor color scheme.

Mund metal is used profusely on ship board, particularly in the pantries and galleys. This pantry is located immediately aft of the dining saloon on the port side. It is elaborately fitted with stout tables, chairs and glassware racks, modern griddles, egg boilers, and toasters. Kettle service and pump-out service is provided. In fact the Dohrman pantry and galley units in most cases generally pre-empted very close in front of the big doors. The pantry rates

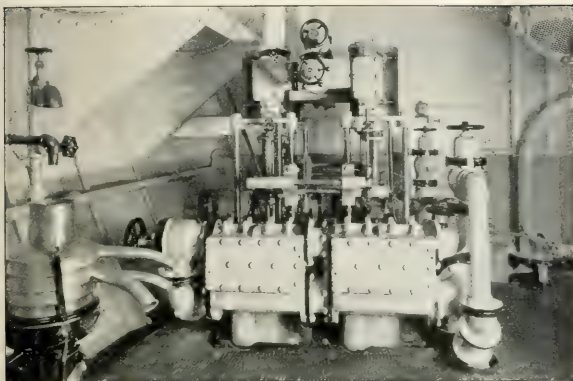
Considering the fact that her regular service is in overnight run, the Waialeale is very completely equipped to take care of the culinary department. Above is shown the pantry, completely covered with Mund metal and equipped with modern electrical devices for short order work and steam tables for serving. Below is a view of one side of the galley featuring the Ray oil-burning range.

An elaborate system of ventilation takes care of all enclosed spaces on the vessel. At the right is shown one of the big electrically operated blowers on the boat-deck. In the picture of the pantry is shown the arrangement of the ventilating ducts.



stewardship immediately aft of the pantry. It is equipped with Ray oil-burning ranges, a Blakeslee roll warmer, a Hobart electric mixer, and many other culinary conveniences. Arrangement and equipment of the pantry and galley was very largely planned and supplied by the Dohrman Hotel Supply Company of San Francisco.

The table linen furnished especially for the Waialeale includes 170 Rosemary Basco damask table cloths and 100 dozen Rosemary Basco linenized cotton napkins furnished by James L. Wilson. Silverware was furnished by the International Silver Company.



One of the Warren steam pumps on the lower grating of the engine room.

Propulsion Machinery

On her usual schedule for the Honolulu-Kauai run, the Waialeale requires but 10 knots an hour at sea. Her owners desire, however, that she should be powered to make 15 knots at sea so that she might serve on the schedule of the steamship Haleakala on the longer overnight run from Honolulu to Hilo on the Island of Hawaii, where 15-knot speed is necessary. After careful consideration, geared steam turbine propulsion units were chosen, and these were especially designed by Westinghouse Electric & Manufacturing Company to cover, with maximum economy, the wide range of operating speeds and powers required. These turbines

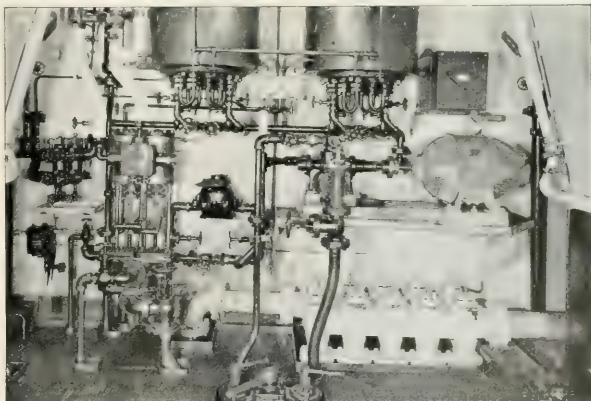
are described in detail in a separate article in this issue. They generate 4000 shaft horsepower at full load and on trial trips in San Francisco Bay drove the ship at better than 15½ knots an hour.

Steam is generated in four Babcock & Wilcox marine water-tube boilers with superimposed superheaters. Each boiler has 3067 square feet of heating surface, giving a combined total heating surface of 12,268 square feet for the four boilers. They were built for a working pressure of 280 pounds per square inch and a superheat of 75 degrees Fahrenheit. The furnaces were arranged for oil fuel,

and each is equipped with four Babcock & Wilcox mechanical oil burners of the Cuyama design. A special double furnace front construction is used to provide for either natural or assisted draft. Each boiler is served by an electric-motor driven blower built by the Western Blower Company of Seattle. The blowers are located at the rear of the boilers and the air is led through ducts under each boiler to the double furnace front. Each boiler is fitted with Diamond Power Specialty Company Model G.2 marine type soot blowers.

Fuel oil is transferred from the various bunkers to the service tanks by a Warren 10 by 7 by 12-inch vertical duplex piston pump, supplied by the Western Engineering Company. Service fuel oil to the burners is provided by two pumps. One of these is an electrically driven Quimby screw type pump capable of delivering 15 gallons of fuel oil per minute against a pressure of 200 pounds per square inch and driven through a Fast flexible coupling by a Westinghouse 7½-horsepower, 850-revolutions per minute, S.K. type, shunt wound, enclosed, self-ventilated motor. The other oil service pump is a steam driven Warren 5¼ by 4 by 8-inch vertical duplex type.

Feed water is handled by two Warren 12 by 9 by 24 vertical, simplex steam pumps. There is one Davis improved Paracoil closed type feed water heater, with a capacity for raising 55,000 pounds

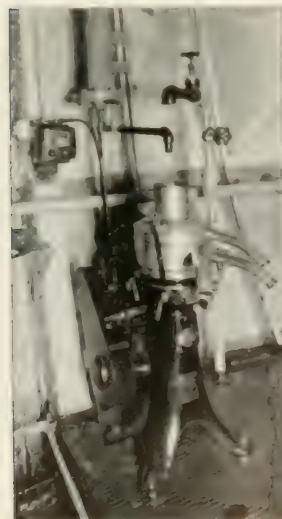


Above are shown the two fuel oil service pumps; one an electrically driven Quimby, screw type; the other a steam driven, Warren, vertical duplex type. At the left is a view in the boiler room featuring Western Blower Company's electric drive blowers for assisting the furnace draft.

is being pumped down to the pump room and then to the feed water tank. The feed water tank is located in the pump room and is connected with the pump room by a pipe. The pump room is located in the pump room and is connected with the pump room by a pipe. The pump room is located in the pump room and is connected with the pump room by a pipe.

When the feed water is pumped down to the pump room, it is pumped down to the pump room and is connected with the pump room by a pipe. The pump room is located in the pump room and is connected with the pump room by a pipe. The pump room is located in the pump room and is connected with the pump room by a pipe.

Pneumatic tank gauges, conveniently located, indicate to the engineer the condition of his oil and water tanks. Tyco's stack temperature indicators and Ramarex carbide detectors indicate every condition.



De Laval centrifugal oil purifier.



The Davis Paracoil evaporator.

The Chevalier Drainwater steam trap is used to drain the boiler.

For keeping the lubricating oil in good condition for the gears and bearings on this plant, the Western Engineering Company furnished two Davis Paracoil lubricating oil coolers, each of which is capable of reducing from 110 to 100 degrees Fahrenheit the temperature of 200 gallons of Calor extra heavy turbine oil every minute when supplied with 400 gallons per minute of sea water at 80 degrees Fahrenheit. The De Laval-Pacific company of San Francisco furnished a De Laval centrifugal oil purifier to purge the lubricating oil of all moisture, grit, or dirt.

Ventilation

In a semi-tropical climate like that of Hawaii, an abundance of cool, fresh air is necessary for comfort. And in keeping the Waiialeale great care was taken to make her natural ventilation as effective as possible and, in addition, a complete ventilating system has been provided for this vessel in accordance with the latest and most modern practice on vessels for the Hawaiian Islands and South Pacific waters. Every compartment of the vessel, including passenger spaces, galley, pantries, storerooms, holds, machinery spaces, boiler rooms, shaft alley, has been properly and efficiently ventilated with mechanical exhaust and supply ventilation. In this connection the Western Engineering Company fur-

nished the Waiialeale with a number of the electric direct connected blowers.

The electrical system connected to the blowers operating as supply blowers are the main engine exhaust, galley and storage spaces. The passenger and baggage forecast, pantries and storerooms are served by 112 blowers operating as exhausters.

In a number of instances the blowers with direct connected motors are located on deck and are subject to the elements. Under these conditions the motors are made water-tight with non-corrosive fittings and with speed regulating rheostats enclosed in protected housings.

The construction of the blowers and motors is a direct consequence of the extreme conditions encountered. The motor is mounted directly on the deck in a cast iron bowl bolted to a cast iron bowl. This bowl is in turn bolted to the cast iron side of the blower. On the inlet side, a cast iron inlet flange is bolted to the cast iron side. The two cast iron sides of the blower are thus exactly alike, with holes drilled alike. Consequently bowl and inlet flange can be interchanged, giving change of drive. Legs are bolted to the cast iron sides and can be put on in any position, giving any angle of discharge. The blower wheel is mounted directly on the motor shaft and, as the blower is pushed up against the bowl, the hub of the wheel is

(Continued on Page 513)



Vulcan refrigerating machinery.

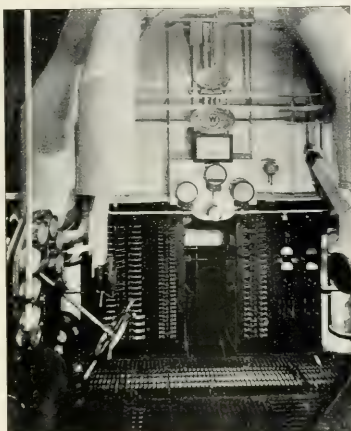
Propelling Equipment of Steamship Waialeale

By I. Short, Marine Engineer,
Westinghouse Electric & Manufacturing Co.

THE steamship Waialeale is to be operated around and among the Hawaiian Islands by the Inter - Island Steam Navigation Company. As the ship will be at all times a great distance from any manufacturer of propelling machinery it was essential that the equipment be most reliable. Economy was also an item as all oil must be shipped into the Islands. The responsibility for the choice of equipment was placed on the very capable engineers of the largest operator of ships to the Hawaiian Islands. These engineers having wide experiences with different types of drives decided that geared turbines would be the best choice for this ship. This decision was based on reliability, economy, weight, cost, maintenance, and ease of maneuvering.

The Waialeale is a twin screw steamer. Her turbines develop a maximum of 2000 shaft horsepower on each screw at a propeller speed of 135 revolutions per minute, corresponding to a hull speed of 16 knots. She will operate the greater part of the time on a run requiring $9\frac{1}{2}$ to 10 knots or a propeller speed of 85 revolutions per minute, corresponding to 350 shaft horsepower. At times on other runs the ship will be required to make 12 knots and 14.3 knots. Shaft horsepower corresponding to ship speeds and turbine and propeller revolutions are given in the table herewith.

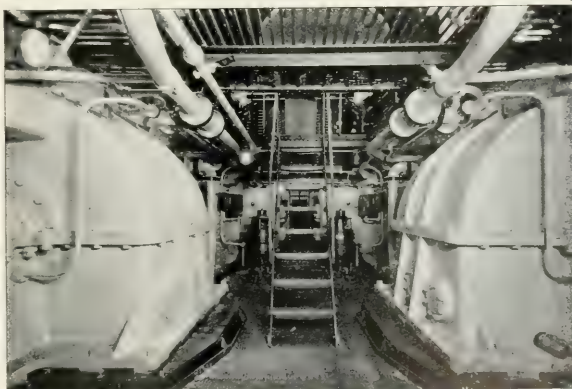
The propelling equipment for the Waialeale was built in accordance with the rules of the United States Steamboat Inspection Service and the requirements of the American Bureau of Shipping. The turbines are designed to operate with 265 pounds gauge pressure and 75 degrees Fahrenheit superheat at high pressure ahead and astern nozzles. Connections are provided on the turbine casing for admitting excess exhaust steam from the auxiliaries. At light load the auxiliary exhaust will be admitted in the impulse chamber and at full load about mid-



View looking forward from the operating platform, showing the switchboard and gauges on the forward bulkhead of engine room.

way of the reaction blading. A constant pressure valve automatic-

Knots	Total S.H.P.	S.H.P. per Shaft	R.P.M.	
			Turbine	Propeller
10	700	350	2270	85
12	1320	660	2720	102
14.3	2400	1200	3220	121
15.9	4000	2000	3600	135



View looking forward from shaft alley entrance on the lower platform of engine room, showing gear casings, vertical condensate pumps, and the ends of the condensers.

ally admits to the turbine auxiliary steam not used in the feed water heater. An oil relay closes this valve if the turbine overspeeds. While maneuvering it is closed by opening a three-way valve at the maneuvering stand.

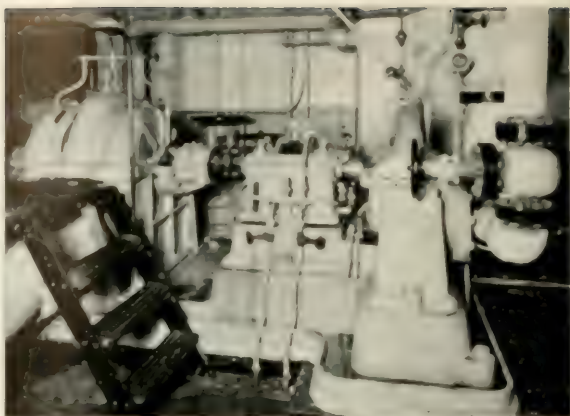
The ahead nozzles of the turbines are arranged to produce the most efficient operation of the ship at the different speeds, each turbine being equipped with two ahead nozzles either or both of which may be open. The smaller nozzle is designed to develop 350 shaft horsepower with a turbine speed of 2270 revolutions per minute. The larger nozzle is designed for 1600 shaft horsepower with a turbine speed of 3440 revolutions per minute. With both nozzles open each turbine will develop 2000 shaft horsepower with a turbine speed of 3600 revolutions per minute. Efficiency at full load is sacrificed to a certain extent to obtain the best possible efficiency at the lower loads at which this ship will operate the greater part of the time.

Each main propelling unit con-

one of a Westinghouse compound steam turbine, the compound turbine is designed for the driving of the main shaft through a double reduction gear. The type of turbine motor is of the impulse principle, in the turbine principle, where it is most efficient and the reaction principle at the same principle state the design is most efficient.

The reaction is a matter of high efficiency and one in which the original efficiency is maintained through the life of the turbine. There are no internal discharges through which some types of turbines are very regular, because the high pressure reaction the turbine produces the same of the reaction turbine that would otherwise be required in this portion of the turbine is eliminated. This construction produces a short rigid spindle in which the first critical speed is well above the maximum operating speed. It has the further advantage that even should the bearings wear down sufficiently to cause stripping of all the reaction blades due to loss of oil, the impulse blades would still develop about 50 per cent of full power.

The impulse element consists of a two-row impulse wheel. All rotating impulse blades are made of stainless steel machined from bar stock. The stationary reaction



One of the Westinghouse steam turbine driven centrifugal pumps for circulating water.

blades are cast of monel metal. All blades are smoothly finished and are shaped to provide the most efficient steam passage. The impulse blades are so shaped during the manufacturing process that the tip of each individual blade forms a section of the shroud. After the blades are installed the tips are machined and a groove is cut into the purpose, into which a nickel sheet strip is pressed and soldered.

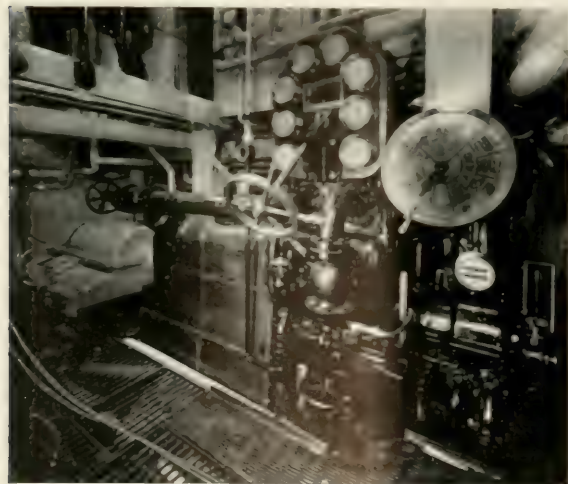
The first rotating impulse blades are fastened in the groove of the rotor by means of pins which extend through the blade root. The stationary and second rotating rows are provided with machined shanks which fit into grooves cut in the cylinder and spindle respectively.

A reversing element is located in the main exhaust chamber and consists of a two-row impulse wheel very similar to the ahead impulse element. This astern turbine is capable of transmitting 60 per cent of the full speed ahead power with full speed ahead steam flow.

The reaction element consists of 21 pairs of rows. The rotor is cylindrical in shape while the cylinder is conically bored. This provides a gradually increasing area producing the most efficient passage for the steam. The rotating reaction blades are of nickel and the stationary reaction blades of manganese bronze. The reaction blades are secured in dove tail grooves by a positive mechanical interlock between blade, the packing piece, and the side of the groove. Lashing wires in sufficient number are provided for bracing the upper ends of the blades.

The turbine rotor is of the hollow drum construction which produces a very rigid rotor. It is made up of two parts, of forged steel, securely bolted together. Both the ahead and astern impulse wheels are integral parts of the rotor element.

A Kingsbury thrust bearing mounted at the coupling end to



View showing one side of the control stand with Kingsbury room telegraph and one of the Westinghouse main propulsion turbines with its control wheel and gauge board. At the left is the top of the gear casing.



The fire room of the Waialeale showing the furnace fronts of the four Babcock & Wilcox boilers with drip pans under each burner. In the center will be noted the Tycoos stack temperature recording apparatus.

maintain the turbine rotor in the proper axial position is of an improved design having a leveling block back of each shoe automatically to distribute the load equally over all the thrust shoes. The bearing is supported to permit adjustment of the end position of the turbine rotor by turning a shaft which projects through the bearing housing. One complete revolution of this shaft moves the spindle 0.005 inch.

Maneuvering valve, governor valve, and strainer are bolted together as a unit and mounted on the turbine cover directly over the exhaust.

Admission of steam to the ahead and astern nozzles is controlled by two balanced throttle valves both of which are contained in one body and operated by the same hand wheel. Turning the wheel in one direction admits steam to the ahead nozzles and in the other direction to the astern nozzles. It is impossible to open both valves at the same time.

The governor supplied on these turbines is similar to the latest type oil operated governors which have been supplied on several hundred land turbines and several marine turbines with entire success. An impeller is mounted on the end of the turbine spindle. This impeller, which is supplied with oil from the gravity system supplying the turbine and gear bearings, is similar to a centrifugal pump runner operating at very nearly a closed discharge condition. The discharge pressure is then almost directly proportional to the square of the turbine speed.

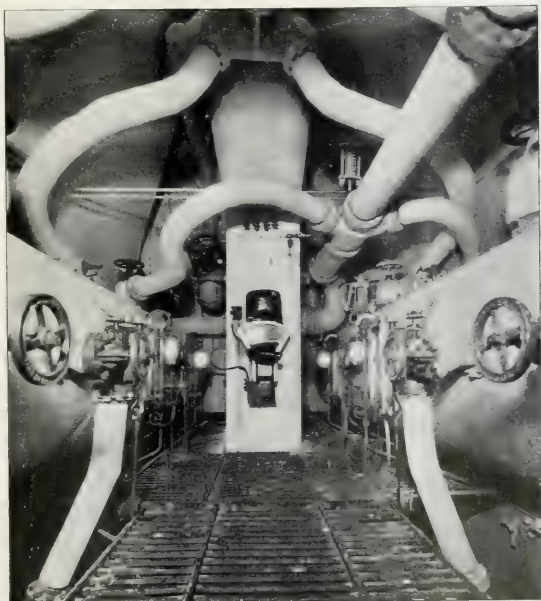
The governor valve is held open

by a compression spring acting against a piston in the governor operating cylinder. Oil pressure from the discharge of the oil impeller on the turbine rotor acts above this piston in opposition to the compression spring. When the turbine speed reaches the point for

which the governor is adjusted, the oil pressure counteracts the spring load and the valve is closed cutting steam off from the turbine. This is a positive acting overspeed governor with the further advantage that when the speed drops to normal the valve opens allowing steam to again enter the turbine. There are no moving parts to this governor and nothing to get out of order or on which any wear takes place.

The turbine is supplied with an automatic stop which closes the governor valve if the turbine spindle moves endwise due to burning out the thrust bearing. This governor lends itself to remote speed control. As this ship will operate the greater part of the time at reduced speed this feature has been incorporated in a simple form. A small hand wheel placed near the maneuvering wheel adjusts the governor to maintain any speed desired.

The glands for preventing leakage where the spindle extends through the casing at each end are of the combined steam and water



A remarkable view on the upper grating of the Waialeale boiler room, featuring the beautiful pipe fitting work of the Union Plant of the Bethlehem Shipbuilding Corporation and showing the Ranarex carbon dioxide indicator, Diamond soot blower connections, and Plant asbestos pipe covering.

loaded traps. The water potential in response to these differences in soil moisture should have increased with increasing soil moisture. Because 1800 revolutions increase the amount of water in the pot, a positive control entry generated by the flow from the potometer should have increased substantially during the 1700 seconds in which the water in the potometer flows through 1800 revolutions per minute.

The turbine housing is a close grained cast iron. The ahead and astern shaft bearings are mounted to cast into the housing which are secured to the turbine cylinder. The turbine is mounted directly above the condenser and the exhaust flange is bolted directly to the condenser base. This arrangement supports the weight of the turbines, eliminating the main cause of turbine trouble. The condenser is suspended from a structural support at the top and serves as the turbine support at the exhaust end. At the high pressure end the turbine is supported by a vertical web I-beam. The bending of the vertical web of the I-beam permits free longitudinal expansion of the turbine cylinder.

Each double reduction gear is built on a single base and the gears are arranged in a nearly vertical plane in order that the turbine might be located high enough above the ship's bottom to permit installation of the condenser underneath. The low speed pinion is aligned outward with reference to the gear shaft, which permits either the turbine or gear to be dismantled without disturbing the other.

These gears are in the Whirling house floating frame type, in which the high speed pinion and slow speed pinions are each carried on two bearings mounted in a heavy frame. The frame is supported in the middle of its length by an I-beam placed at right angles to the axis of the pinion. The flexing of the web of the I-beam permits the whole frame to rotate a slight amount, allowing the pinion to follow the gear wheel and automatically maintain alignment of the pinion and gear teeth. This insures a uniform tooth pressure over the entire face even though the gear case be distorted due to wear in the ship's structure.

Pinions are made of heat treated carbon steel. The gear wheels are built up of cast iron centers and forged steel rims. The high speed gear wheels are mounted on the low speed pinion. The low speed

and remote from the turbine

A standard offset layout of Kingsbury leveling block type is shown in the main part of the technical note. It is intended to be printed about in any standard size of the main part of the note.

[illegible]

Each stage is driven by a 50-horsepower geared turbine. A vertical motor driven condensate pump removes the condensing water from each condenser. The air removal unit consists of two Westinghouse multi stage, high efficiency, condensing type air ejectors, mounted on a common intermediate shaft driven by the turbine.

Auxiliary Power

To take care of the auxiliary lighting and power load on this vessel, the U. S. Coast Guard has selected the new geared generator set as standard 7½ horsepower generator set for future motor launch projects. The Coast Guard's department and its fleet have been assured. The new generator set is 8½ horsepower and weighs less than the generator set of the same horsepower and output.

These geared turbine generator sets are the last word in design and it is rather misleading to refer to this type of turbine generator as a geared set because the usual operation of the geared turbine generator set is one of a gear consisting of a turbine having its own bearings, coupled to a gear unit having four bearings and a generator. This means a set having eight bearings. The new turbine generator unit has only five bearings.

On these new units there are a number of outstanding new features. These include: overhung turbine rotor, oil governor, restraining rings, new lubricating system, external oil cooler, duplex strainer, auxiliary steam driven oil pump, and the absence of flexible couplings. In addition to these new features the Westinghouse Electric Company engineers included in these new turbines some of the well-tried and reliable features of their previous designs among which may be mentioned the single impulse wheel, water sealed spindle gland, emergency stoppage governor, and a full speed starter.



Two of the Cunningham steam cargo winches on the boat deck of the Waialeale. All the cordage shown in this picture is Columbian Tape Marked Rope. In fact all manila rope used on this vessel is from the Columbian Rope Company.

The restraining ring (furnished in addition to an emergency overspeed governor) of Westinghouse turbines is an additional safety precaution that is found in no other make of turbine. With the restraining ring protection the operator is in no danger of personal injury in the event of accidental overspeeding.

An unusual feature of the new turbines is that, although the unit is in operation, the speed can be changed from about one-third speed to full speed without stopping the turbine. This characteristic is of considerable value in certain industries.

Another recent development incorporated in the new generating

sets is one pertaining to the gears. As a result of considerable research work a method of gear-cutting is employed at the South Philadelphia Works of Westinghouse Electric Company that makes the gears practically noiseless at any speed. It is the opinion of many persons that a silent high speed gear is impossible to manufacture, but the gears of a unit of this new design operate so quietly, when carrying full load of 100 kilowatts, that, with the hand hole cover removed from the gear case, the only noise heard was the splashing of the lubricating oil inside the housing.

The Waialeale is a Westinghouse ship from the griddle in the galley to the marine fans in the state-rooms.

through Hough and Egbert, San Francisco agents, is installed in all holds and the paint and lamp lockers, with an indicating cabinet in the pilot house. A Derby fire alarm system (also furnished by Hough and Egbert) protects passengers' and officers' staterooms. Two Warren 12 by 8½ by 12-inch vertical, duplex steam pumps supply water under suitable pressure for the fire mains, and fire hose reels are distributed throughout the ship in suitable locations in accordance with the regulations of the United States Steamboat Inspection Service.

Six pairs of the latest type Steward davits on the boat deck serve five surf boats and a gasoline engine driven launch. These boats were built by George Kneass & Son of San Francisco and the engine of the launch is a Frisco Standard. In addition there are four self-nesting Lundin lifeboats. This equipment will, in an emergency, take care of all passengers and crew. A Cunningham steamboat hoist located amidships on the boat deck is fitted with extension shaft and gypsy heads to assist in boat handling.

Cargo Handling

We have already alluded to the departure from conventional lines in the arrangement for getting headroom in the automobile storage on this vessel and to the large hatch serving two forward holds. For handling cargo, the Waialeale is provided with five Cunningham steam cargo winches manufactured by Allan Cunningham of Seattle. These have an 8 by 8 inch double steam cylinder with piston type reversing valve and are of the single drum, single spur geared type. Special attention was given to making these winches quiet-running for this passenger vessel. All gearing is enclosed in oil-tight housings and is arranged to run in a bath of transmission lubricant.

Taken all in all, the Waialeale is one of the "biggest little" ships afloat and we predict that she will be a great favorite in the Hawaiian Inter-Island Service.

The Inter-Island Steamer Waialeale

(Continued from Page 308)

very close to the motor bearing, giving small overhang. The scroll is of extra heavy sheet steel and all parts are assembled with cap screws.

As will be noted from the illustrations, this method of assembly produces a compact, neat unit, pleasing in appearance and easily adjusted to fit out of the way into corners or against bulkheads.

Each stateroom is fitted with a Westinghouse marine type fan. Two Vulcan refrigerating units supply ample cold storage for steward's stores and abundance of ice water for passengers, as well as thirty tons capacity refrigerator cargo space.

Navigation and Safety Equipment

The bridge of the Waialeale is fitted with all the modern aids to navigation required in a vessel of her type and service. This equipment includes: Three Lietz standard compasses and one Lietz electric sounding machine; two Cory-Kent clear-vision screens, Cory engine room telegraphs, and Cory anti-noise telephone; Sperry revolution indicator; Plant Mills direction indicator; and Walkers patent log.

The steering gear was supplied by the Hyde Windlass Company. This steering gear is of the standard right and left hand screw type, with connecting links to rudder crosshead. The screw gear is supported in heavy pedestals with guide rods to relieve bending action on the screw. The engine is located immediately forward of screw gear

with flexible coupling between engine and screw shaft. The engine is a double cylinder, 9 by 9 inches, of the spur geared type, provided with automatic follow-up mechanism. Hand steering is also provided by means of two large 6-foot diameter mahogany steering wheels. Automatic follow-up mechanism of steering gear is controlled by means of the Brown type hydraulic telemotors. The transmitter of this telemotor is located at the steering wheel in the pilot house. The receiver is arranged adjacent to the steering engine. Connection between the forward and after portions of telemotor consists of two ¾-inch copper tubes.

A Hyde steam windlass takes care of the anchor and anchor chains. This is of the spur geared type with two wildcats fitted for 1-15/16 inch stud link chain, each cat having an independent locking gear. The engine is double, 8 by 10 inches, self-contained on the same bed plate as the windlass. Quick warping heads 15 by 20 inches are fitted on the intermediate shaft. All gears, pinions, clutches, wildcats and locking heads are of cast steel. All gear teeth are machine cut with standard involute cutters, and all gearing is fitted with guards. This windlass will handle both anchors and chains simultaneously and will raise one anchor with thirty fathoms of chain out at the rate of 50 feet per minute.

To guard against fire a Rich smoke detection system, furnished by Walter Kidde & Company,



Large Diesel-Electric Dredge

THE purpose herein is to briefly outline the general construction and installed construction of the New Jersey, a 50-foot-diameter dredge with a complete diesel-electric power plant which was finished late in the fall last year by the Busch-Sulzer Company for the Great Lakes Dredge & Dock Company. The Busch-Sulzer Company had a contract for the construction of the dredge and themselves built the dredging mechanism, sustaining the contract for the construction of the hull and the installation of the machinery in the Montclair, New Jersey, & Detroit, Michigan, Companies. Complete electric equipment for this dredge was furnished by the General Electric Company.

The New Jersey is a 50-foot power plant but it can self-propelling. It can move slowly in either direction by means of the so-called "walking on its spuds," but when it has to be moved any distance the dredge is taken care of by towing launches.

The main power plant consists of four 800-kilowatt, 600-volt General-Electric generators, each driven by a directly-connected 1150-horsepower, 180-revolutions



The diesel-electric dredge New Jersey, built by the Busch-Sulzer Company for the Great Lakes Dredge & Dock Company.

per minute, 6-cylinder, 2-cycle, single-acting Busch-Sulzer diesel engine. The auxiliary power plant consisted of two 50-kilowatt General-Electric generators each driven by a directly-connected 1150-horsepower diesel engine. The 1150-horsepower diesel engine and the other at 125 volts. The two switchboards are connected through a 50-kilowatt motor generator set which takes 600 volt juice from the main switchboard and supplies 125-volt current to the auxiliary switch-

board. Thus, in case of emergency, even when the dredge is not operating, both switchboards can be supplied from either or both of the 50-kilowatt auxiliary generators. In addition there is a 5-kilowatt gasoline engine driven generator to supply power for lighting when all operations are shut down.

The main dredge pump is driven by 3000-horsepower, direct-current motor, and the cutter for this pump by a 600-horsepower, direct-current motor. This cutter motor is of very



Above, view along the side of the New Jersey, featuring the steel floats for the pipe line. At right, above, General Electric 600-horsepower motor and gears for the cutter.

At right, below, pilot house control.



As will be noted in the illustrations, a very fine job of ship fitting and riveting was done on this dredge. In addition to the hull,



there was included in the contract a number of the circular steel tank floats shown in one of the illustrations, for supporting the 30-inch discharge line of the dredger. The house on the dredge contains comfortable quarters for the dredge crew and a well appointed electrical galley.

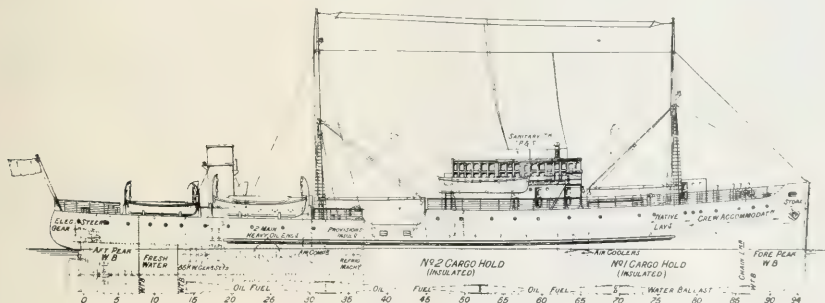
A Burmeister & Wain 33-kilowatt diesel-electric generating set and a 5-kilowatt Penta oil-engine electric generating set provide light and auxiliary power. An electric cargo winch, an electric steering gear, and an electric ammonia refrigerating machine are fitted.

Her principal characteristics are, length 210 feet; breadth 35 feet; depth molded to upper deck 16 feet. She is of the raised quarter deck type, with combined bridge and forecastle, straight stem, cruiser stern, and cellular double bottom fitted to carry fuel oil. Her cargo holds are completely insulated for the transportation of fruit and meat. There are a number of comfortably furnished, well ventilated staterooms, spacious promenade decks, nicely furnished dining saloon, and smoking room.

The Maui Pomare is propelled by two screws driven by two 6-cylinder, trunk piston, 2-cycle, crank case scavenging Pétters oil engines generating 600 brake horsepower each and giving the vessel

The first of these, the motorship Melinga, was built and engined by Burmeister & Wain, Ltd. of Copenhagen for the North Coast Steam Navigation Company, Ltd. of Sidney. She is 161 feet 3 inches length over-all, 34 feet 6 inches molded beam, and 9 feet 6 inches

The principal features of hull are the large cargo hatch forward, which, as will be noted from drawings, is 14 feet by 42 feet, and the reinforced lattice girders fore and aft through the cargo hold. Oil tanks are fitted for 110 tons of diesel fuel, and the forward and



315

11. 4-wheel speed on two frames, with front two wheels brought in for braking. The two rear wheels are mounted on the same axle and rotate together. The front wheels are mounted on separate axles and rotate independently. The gear ratio is 1:1.

12. 4-wheel horsepower capstan, all electrically driven; an electro-hydraulic steering gear; and an electrohydraulically independent circulation system. The brine pipes circulate direct through the frozen meat for 24 hours, then return and so the two air handling rooms from which cold air is blown through the fruit cargo in insulated rooms. No. 1 and 2.



Messrs. Messers, recently delivered by Harbormaster and Wain to the North Coast Steam Navigation Company, Ltd. of Sydney.

Trial Trip of Motorship Mary Ellen O'Niel

THE 100-ton tanker *Marion O'Neil*, built by the Sun Shipbuilding Corp. of Chester, Pennsylvania, for the California Petroleum Corporation and described in a former issue of *Pacific Marine Review*, completed her maiden trip in a most satisfactory manner, having recently arrived at San Pedro with a full cargo of 140,240 barrels of gasoline in addition to her fuel. This tanker is driven by twin screws, each directly connected to a 4-cylinder, 2-cycle opposed piston Sun-Doxford diesel engine.

W. L. Bunker, manager of the Marine Department of the California Petroleum Corporation, is authority for some very interesting details of her performance, both on her trial trips and during her run out from the Atlantic Coast.

After leaving the builder's yard, she was first tried out maneuvering. Although at the time she was drawing out 14 feet forward and 17 feet 6 inches aft at the speed of 12 knots, her engines were reversed and it was ascertained that she came to a full stop in exactly five minutes and thirty seconds, as quickly as a steam reciprocating job would have done it, and considerably quicker than would a turbine under same conditions. Various tests up to her steaming and handling qualities were made, including complete and half circle swings, and she performed in a most satisfactory manner.

All anchorages were at the same time run to their full rated capacity. The anchor windlass test was made by giving the starboard anchor 60 fathoms of chain and the port anchor 45 fathoms. Both an-

There were thoughtful hints in the speech, given the situation in that corner that would which it told us without an apparent effort.

After putting the ship down to her
 (the ship) and the fact that the
 (the ship) was not the same different
 (the ship) being painted with the (the ship)
 (the ship) (the ship) (the ship)

Year	Model	Year	Model	Speed
1991	1991-1	1991	1991-1	1991-1
1992	1992-1	1992	1992-1	1992-1
1993	1993-1	1993	1993-1	1993-1

During the above runs everything worked admirably and to the complete satisfaction of the inspectors representing the Navy. To insure an absolute certainty that the engine and its parts were in the best condition of some of the most vital parts, injection oil pressures were for a time brought up to as high as 12,900 pounds per square inch and not the slightest leak or strain was noticed. However, the main engines were not allowed to exceed 90 per cent of rated revolutions, as Mr. Bunker considers it best not to subject an engine to full load while new, believing, quite rightly, that too much speed and heat on first runs are detrimental to any internal combustion engine.

At full speed the slip was 12.3 per cent, a very fine result, showing good design of both hull and propellers. Lubricating oil pressure was about 26 pounds, and scavenging air pressure 1.9 pounds. Lubricating oil consumption averaged $1\frac{1}{2}$ gallons per hour, and cylinder oil less than $\frac{1}{2}$ gallon for the same time.

When loaded and on the run to the Pacific Coast her average speed was 11.37 knots per hour for twenty days two hours, making by observa-

her fuel consumption for all purposes was 118.2 barrels per twenty-four hours, with a horsepower of 4188. No attempt to drive her was made, as Mr Bunker had given the chief engineer instructions regarding a minimum and maximum number of revolutions, which averaged 77.6 per minute throughout the trip.

It is very evident that the build-
ers are to be congratulated on the
vessel's performance, and unques-
tionably the owners are pleased and
gratified. While many motorships
have made splendid records, it is
perhaps worthy of remark that the
first trips of the Mary Ellen O'Neil
were absolutely free from any dis-
turbng incidents either on her
trials or first run in service. Ar-
riving at San Pedro she needed no
adjustment whatever, and was run-
ning steadily as a clock when she
left for duty again at sea.

Trade Note

Capt. Wm. C. Waack, San Francisco manager for the George W. Wilkenrodt interests, San Francisco, has branched out for himself, and with tugs and barges is engaged in general towing business. At present he has a contract with Hickman quarries at Courtland, which in addition to other work, will keep his fleet employed.

W. G. Winne, district freight manager at Los Angeles for the Luckenbach Steamship Company, has been promoted to the traffic department of the company's New York office.

T. G. Maddox, district manager for the company with headquarters at Portland, has been promoted to assistant district manager at Los Angeles, a newly created position.



In the Engine Room

An Interesting Development in Steam Drive

Canadian Pacific Steamship Company Introduces
Novel Methods for Economy

THE Canadian Pacific Steamship Company seems to have set its mind and heart on the problem of proving to the world that real economy lies along the lines of improving the steam cycle rather than along internal combustion lines. On a conversion job in the steamship *Empress of Australia* they achieved the remarkably low fuel consumption of 0.69 pound of oil per brake horsepower hour for all purposes.

A new liner, the *Duchess of Bedford*, was delivered to the Canadian Pacific about June 1 by John Brown & Co., Ltd., of Clydebank. On her trials the propulsion machinery delivered a brake horsepower on 0.64 pound of oil for all purposes. This ship's power plant has some very interesting characteristics.

The ship herself is 600 feet long, 75 feet beam, 53 feet deep (bridge deck to keel), and 27 feet load draft. She accommodates 600 cabin class, 500 tourist class, and 500 third class passengers, and has a crew of 409.

Two sets of Parsons, three casing type, single reduction geared turbines generate a total of 20,000 shaft horsepower. Steam is supplied by six Yarrow, three drum type, water tube boilers and two Scotch boilers in two boiler rooms, each housing three water-tube and one Scotch boiler. The water-tube boilers supply steam at 370 pounds and 680 degrees Fahrenheit to the propulsion machinery and the Scotch boilers operate at 200 pounds, supplying the steam driven auxiliaries and providing make-up feed water for the water-tube boilers, this latter being fed as steam into the intermediate stage of the main turbines.

The auxiliary steam and the auxiliary feed circuits are entirely se-

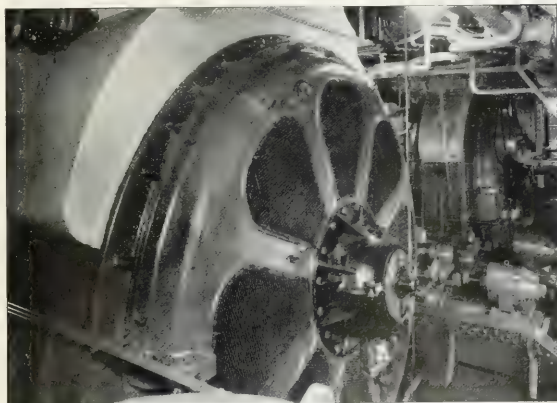
parate from the main steam and main feed circuits. This eliminates reducing valves and desuperheaters, and prevents oil and grease finding its way into the water-tube boilers from the cylinders of the auxiliary engines.

The main air pumps, main feed pumps, and auxiliary feed pumps are steam driven, the main circulating pumps and most of the other engine and fire room auxiliaries are electrically driven. There are two 500-kilowatt turbo-generating sets and two 450-kilowatt diesel generating sets. Air for the furnace is preheated in large multitubular air heaters to 320 degrees Fahrenheit

and feed water is raised to 300 degrees Fahrenheit.

The main turbines are arranged with the high pressure casing at the top directly above the shaft center line, and with the intermediate casing inboard and the low pressure casing outboard. The low pressure casing sits directly on top of the condenser to which it is bolted. The condenser is of the Weir regenerative type.

This plant (taking the published figures on their face value) demonstrates the possibilities of getting wonderful fuel economy with steam at conservative pressures and superheats.



View looking across the forward end of the two main propulsion motors of the *Panama Pacific liner California*. Perhaps no one development in merchant shipping has attracted more attention popularly than the introduction of electric propulsion in merchant shipping. The motors shown are General Electric Company synchronous type induction motors, each rated at 8500 shaft horsepower when turning 120 revolutions per minute.

Electric power is furnished by two General Electric steam turbines, which run at 2640 revolutions a minute and are direct-connected to General Electric alternating current generators.

This plant gives full power on reverse, a very flexible control of speed, and eliminates vibration.

The Bauer-Wach Steam Propulsion System

A FEW months back we described in these columns a system designed in Germany for increasing the power of steam-turbine propulsion by substituting for the low pressure exhaust of a triple expansion engine one or two pressure turbines mounted in series and connected to the propeller shaft through double reduction, helical gearing and a hydraulic clutch.

Recent advances show that this system is meeting with considerable success. The German Navy placed an order for a new 10,700-ton, deadweight capacity, steamer to have 6000 indicated horsepower machinery on the Bauer-Wach system, giving her 24 knots top speed. The same has been decided to give certain of the existing steamers of the German Navy a considerable increase in top speed and for conversions are now under way in Germany.

Trial data of the original conversion jobs with this system in Germany, however, indicated a possible increase in power of 25 percent without any increase in fuel consumption.

This system would seem to be especially valuable for conversion purposes. The cost of installation on an ordinary triple expansion reciprocating job is very small compared with the benefits derived and the system therefore recommends itself to the owners of vessels which stand at a low valuation on their books and are operating on rates where an increase in speed is very desirable but which do not immediately warrant new tonnage.

A 25 per cent increase in power should produce about 10 knots on an 8½-knot freighter.

Diesel Locomotive Transportation Ashore

FOR certain marine uses diesel-electric propulsion has become almost standard in American practice. This condition has been brought about through a long period of education on the part of various trade journals and engineering salesmen, who have patiently pointed out to the users of propulsive machinery the benefits to be gained by a self-contained electrical system. More recently the same benefits have begun to

attract the attention of executives and particularly the executives of the General Electric Co. to the use of the oil engine combined with electric machinery.

This is exemplified by the project which the General Electric Co. of the Albany, N. Y., office is now carrying out in connection with the conversion of the tug Samson to the electric thrust of the plant. The tug Samson was built by the Ingersoll-Rand Co. and carries two engines, the General Electric Company, supplying the propulsion power and used for the tug's auxiliary power. The tug is now being converted to electric thrust by the General Electric Co. and will be used for the tug's auxiliary power. The tug is now being converted to electric thrust by the General Electric Co. and will be used for the tug's auxiliary power.

An Immense Dock

ONE of the most important marine structures completed recently in Europe is the new Hunter, and William Hunter at their Wallingford shipyard in the north of England. It is for use at Singapore.

This dock is 855 feet long, 173 feet beam, 75 feet high, with a lifting capacity of 50,000 tons. Over



Control stand of an Ingersoll-Rand diesel as installed aboard the tug Samson. Note the simplicity of control arrangement.

1000 tons of steel and 150,000 rivets were built into its frame. The cost of the project is about 30,000 tons per hour. All machinery is electrically operated, current being obtained from a steam turbo-generating station on the dock.

There are some 2000 pumps of the vertical spindle, direct-coupled, electrically driven centrifugal type. These pumps have a capacity of 6000 tons an hour each, two 4000 tons each, and two 2000 tons each. Eight electric pumps are provided a complete system of circulation and these automatically regulate work done in the dock.

The dock will be moved to Singapore in two parts by L. Smit and Co., Rotterdam. Eight Dutch tugs will be used and it is estimated the voyage from the Tyne to Singapore, via Suez, will take 120 days.

All traffic will be cleared out of the canal from end to end to allow the dock to pass through. This dock is one of the largest seagoing structures ever built.

Redesigned Condensers on H. F. Alexander

A NOTABLE job was done on the steamer H. F. Alexander during her recent overhaul. The Foster-Wheeler Corporation completely redesigned the tube layout of the condensers, installing new tube sheets and tubes, these latter being packed with the Wheeler type of material, which, it is claimed, is of the highest quality. The redesigning of the condensers, together with a rearrangement of the air ejector lay-out, resulted in a material increase of vacuum, which is of much benefit in turbine installations, and should increase speed with same or less fuel consumption.

Charles C. Brooks, handling the marine installation work for Fairbanks-Morse diesel engines in the San Francisco territory, and who mobile accident some weeks ago, is was seriously injured in an auto-happily recovering, though it will be some time before he will be on the "front" again.

Chas. E. Ker, who for several years has been outside man for the Main Iron Works, San Francisco, is now supervising the new dredge for the State Harbor Commissioners.

The Algic Maintains Her Good Record

By E. G. Allen,

Westinghouse Electric & Manufacturing Company

ON a recent voyage from Baltimore to New York, the steamship *Algic*, a United States Shipping Board vessel operated by the Roosevelt Steamship Company, ran afoul of a submerged object, breaking off two propeller blades and partly shearing the line shaft coupling bolts.

The *Algic* has attracted considerable attention in the marine field because of her record of economical operation and freedom from repairs, and, in view of this, it is believed that the accident and the extent of the resulting damage will be of interest to marine engineers.

After the accident, it was found that the turbines and gears operated satisfactorily and the ship proceeded to New York under her own power without further incident. It was further found upon investigation that the shaft of the low speed gear was bent about 0.012 inch between the gear coupling flange and the after bearing and also that the section of the line shaft adjacent to the gear was sprung 0.134 inch. The line shaft fitted coupling bolts were indented an eighth of an inch.

The interesting feature of this accident was that the turbines and gears, after being subjected to such a severe strain, emerged without injury to any part of their structure except the slight bending of the main gear shaft, and that the unit then operated well enough to bring the ship into port. Upon raising the gear case cover an inspection of the gear teeth, main thrust bearing, l-beams, pinion frames, and all bear-

ings failed to show the slightest sign of injury.

The *Algic* was scheduled to sail within a short time, and as it would have been necessary to remove the gear shaft in order to straighten or renew it, thus delaying the ship, an available spare set of gears was installed in the same gear case.

The propelling machinery of the vessel consists of cross-compound geared turbines of 3000 shaft horsepower operating at 3600 revolutions per minute and connected through quill shafts to a single case double reduction gear. This gear has a Kingsbury type propeller thrust bearing built onto the forward side of the gear case. This machinery, as well as the main and auxiliary condensers, condenser auxiliaries, line shafting, tail shaft, stern tube, and ring oiled spring bearings, was built by the Westinghouse Electric and Manufacturing Company.

In view of the excellent record of the propelling equipment installed in the *Algic*, which has logged 384,000 miles since 1920, and because of the present good condition of the original gears, with the exception of the bent shaft, it is planned to reinstall this set in the vessel upon her return from the present voyage to India.

"Direct credit for the remarkable record of the *Algic* should be given to Chief Engineer G. M. Gustavson, who has been chief of this vessel for the past three years," says P. R. Smith, operating manager of the Roosevelt Steamship Company.

yards pumped through 100 feet of pipe line. Over a year's records, the total cost of dredging per transport unit stood 54 cents for the diesel-electric dredge, \$1.69 for the geared steam turbine dredge, and \$1.31 for one steam reciprocating dredge.

For the last fiscal year the comparative figures show approximately the same ratio.

The Clackamas power plant consists of four McIntosh & Seymour diesel engines aggregating 3400 shaft horsepower, each directly connected to a Westinghouse direct-current generator. The four generators develop 2300 kilowatts at 500 volts. The pump motor is of 2700 shaft horsepower. Both Sharples and De Laval oil purifiers have been used to clean the fuel oil used in her engines.

All-Water Shipments Detroit to Europe

INSISTENT demand of overseas markets for American automobiles recently resulted in the inauguration of a new development in automotive exporting when the stmr. *Tractor* of Hamburg cleared Detroit for Barcelona, Spain, with an exclusive cargo of Studebaker and Erskine cars valued at a quarter of a million dollars.

The stmr. *Tractor* is the first German vessel to dock at Detroit since the war, and is said to be the first vessel to carry an exclusive cargo of motor cars from Detroit direct to European ports. Passing from Lake Erie to Lake Ontario through the Welland Canal, the ship will follow the St. Lawrence River past Montreal and Quebec into the Gulf of St. Lawrence, thence into the North Atlantic.

Additional interest was roused by the shipment due to the fact that of the 248 cars constituting the cargo, 55 were shipped uncartered. Studebaker is the largest individual user of the unboxed method of shipping cars, having inaugurated this system early in January with a shipment of 500 unboxed cars from New York to Hamburg. By eliminating the cost of crating and uncartering the cars, as well as the increased landed cost of crated cars due to the duty charged in many countries on the value of the box itself, considerable savings are effected for the overseas purchaser.

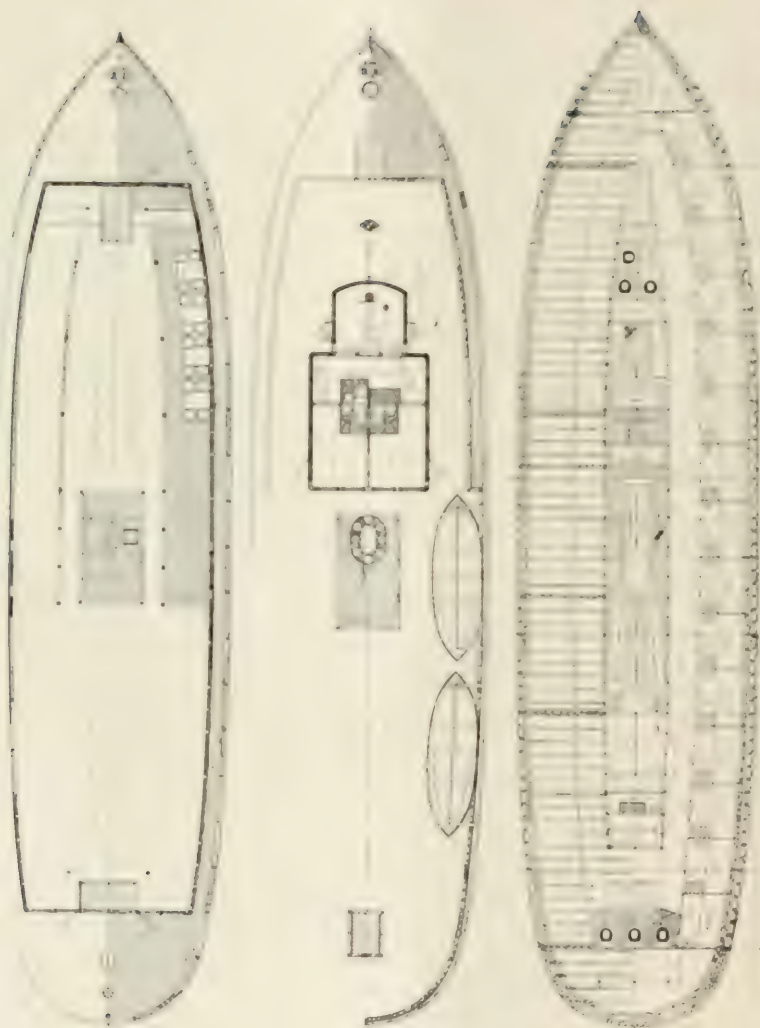
Diesel-Electric

Dredging Economical

IN THE April, 1927, issue of *Pacific Marine Review* appeared an article by James H. Polhemus, general manager and chief engineer of the Port of Portland (Oregon), setting forth the cost of maintenance and operation of the diesel-electric dredge *Clackamas* as compared with the steam dredges working on the same project for the Port of Portland. The comparison was between four 30-inch hydraulic

dredges, one diesel-electric, one geared steam turbine, and two reciprocating steam engine drives. The figures at that time were given in detail and show that the diesel-electric power plant cost for maintenance per brake horsepower about one-half as much as the steam power plant.

For comparative purposes the Port of Portland uses a transport unit which is defined at 1000 cubic



The Valencia, a somewhat unusual triple screw craft built to run between Newport Beach, California and Ensenada, Mexico. Her draft of 4 feet will allow her to enter places prohibitive to most passenger craft. As will be seen from the plans she has many staterooms with a bath and a large dining space on the boat deck. Presumably she will be operated as an excursion vessel and will no doubt be well patronized by parties who during a trip to her beyond the jurisdiction of the United States for week-ends. Ensenada is only a short run south, with all the attractions of Nassau on the eastern coast. Her three diesel engines of 150 horsepower will give her the speed needed for a trip of this sort. The hull construction is on the knuckle side and V-bottom type built with special bracing and fastenings to insure stiffness under weight of shifting crowds of passengers and the thrust of the three diesels. It is rumored that if the venture is financially successful another and probably more elaborate vessel will be built for the same trade.



Workboats and Their Power Plants

San Diego Boatyards

Peter Raska's ship yard, San Diego, is now operating at full capacity. This yard was formerly run by the A. R. Robins Machine Works, but Mr. Robbins desired to devote his entire time to the machinery business and disposed of the wooden hull building business to Peter Raska, shipbuilder of ability and experience in Coast needs. T. H. Cooper is yard foreman. The new management is turning out hulls equal to the former owner, which is sufficient praise. They have just completed the St. Therese, 108 feet length, 23 feet beam, and 10 feet depth. She will be propelled by a Western-Enterprise 375-horsepower directly reversible diesel, and is to be fitted with the latest type bait boxes and gear for handling deep water fish. Fuel space for a 6000-mile cruising radius has been provided.

The G. Marconi, an 85 - footer, with a 200-horsepower Atlas-Imperial reversible engine, is another hull at the yard. This vessel will have electrically operated auxiliaries. In addition to a 12-kilowatt generator directly driven from the main engine, there will be installed an auxiliary 15-kilowatt generator with a heavy bank of batteries which can handle all pumps, hoists, and the lighting.

The White Star is another fishing workboat which is under construction at this yard. She is smaller, being but 51 feet in length, 16 feet beam, and 6 depth; and will be powered with an Atlas - Imperial diesel of 50 horsepower.

A much larger craft is now being framed. As yet unnamed, she is on order of Captain Fred Canapa, and is to be 112 feet length, 25 feet beam, and 10 feet depth of hold. This craft will be powered by a 300-horsepower Union directly reversible diesel and fitted with every modern kind of gear for the profitable and quick handling of fish catches. Like all of her class, she



View of the boat building ways of the Campbell Machine Company, San Diego, with the yacht Norab in shed and the hulls of two large fishing boats on the open ways.

will go out on deep sea runs in quest of fish.

In addition to this new work the yard keeps a staff of men on general repairs, the hauling out cradles being occupied most of the time.

San Diego Marine Construction Co., managed by R. L. Prewett, has a 95-footer on the ways for Captain Guy Silva. She has 23 feet beam by 10 feet 3 inches depth. A 6-cylinder 400-horsepower Fairbanks - Morse directly reversible diesel will furnish ample power for high speed. She will be fitted with an auxiliary diesel driven electric generator of 15 kilowatts capacity, furnishing current for all pumps, hoists, and winches. Her owner is an electrical engineer of parts and very modern in his ideas regarding efficient operation of his craft. Not only in the mechanical arrangements, but in the human equation as well, for this fishing workboat will be different as regards quarters for the crew. There are to be six staterooms, with two berths each. This arrangement will insure the men a certain amount of comfort not always found on vessels of this type.

When the Silva boat is launched another one of the same lines and dimensions for Captain M. M. Perry will be started, the keel timbers and frames being now ready. This one will be powered by an Atlas-Imperial fully reversible diesel of 300 horsepower.

In addition to these two craft in hand, there has been the past season a large amount of work done on repairs at this yard, which is fitted with good hauling out gear to handle craft up to 250 tons. Its new ways just completed extend out 800 feet into deep water, insuring dockage of vessels of 17 feet draft at any stage of tide. The rapid increase in sizes of coasting workboat craft has made this class of equipment necessary.

Campbell Brothers Machine Works, San Diego, are also very busy on workboat business. At this writing there are three on the building ways, besides the palatial yacht for Baron Long previously described in these columns.

One of these workboat fishing craft is for Captain Joe C. Monise.

and will be built by the United Ship Repair Company, San Francisco. The vessel will be built to the same standard as the other boats in the fleet and will be powered by a full-reversible Union Diesel engine of 300 horsepower. It is expected that the new boat will give the company a large amount of work in the summer months of operation.

Another boat in the fleet, the *General*, is being built by the same company. It is expected that the new boat will give the company a large amount of work in the summer months of operation.

ated for the California Packing Corporation. And still another craft of same lines and sizes for Captain John Cardozo, and to be operated for the California Packing Corporation. It is the latest work in Union diesel, fully reversible, of 300 horsepower.

In addition to these three new vessels, repair work has been very good with the Campbell yard, their ways being occupied constantly. A force of joiners is busy on the *Bacon*, long since put in the water. From present appearances this craft will be one of the finest in Pacific Coast waters. Particular attention is being given to the hull, lighting, heating, ventilation, and safety, which will make her a most comfortable and luxurious sea craft.

George Campbell of the firm is of the opinion that the new boats



The Harbor Boat, a new and modern fishing boat, built by the Harbor Boat Building Company, San Pedro, and powered with a 210-horsepower Eastman-Morse diesel engine.

ing boats will soon be laid down. They will be 40 feet long and 30 feet beam, with twin screws driven by two 210-horsepower Eastman-Morse diesels, and will be fitted with an Atlas-Imperial diesel engine. They will be built by the Harbor Boat Building Company, San Pedro, and will be the latest work in Union diesel, fully reversible, of 300 horsepower.

operators recognizing that to insure the good service required in this sort of craft the crew must be given good living quarters. General Engineering Company, San Francisco, is now working on the repair work for the *Bacon*.

Wm. Cryer & Son, Oakland, are building for the Western California Fish Company a new seagoing seiner and handliner which will be engaged by an Atlas-Imperial diesel of 210 horsepower. Since so much of a factor in this craft, to keep outside in any weather, as are staunchness and ability. To insure this she has been designed specially strong and able with attention to detail somewhat above the ordinary. Cryer's yard is also turning out quite a number of stock cruisers, in addition to general repair work.

Robertson's Shipyard, Alameda, has its new floating dry-dock in commission. The first lift it made was on the workboat Peterson No. 4, which was sunk a short time ago after an accident in the Bay. While being repaired she will be fitted with new deck house and other needed improvements. In addition to the repair work at Robertson's, a half-dozen new 500-ton barges have been built for local firms. Since the accidental death of the late James Robertson, founder of the yard, the business has been carried on by the sons, both practical young men, brought up from their schooldays in the building and repairing of ships.

San Francisco Bay Boatyards

United Ship Repair Company, San Francisco, has been busy for the past several months on general ship work. The yard has been working on the *Bacon*, long since put in the water. From present appearances this craft will be one of the finest in Pacific Coast waters. Particular attention is being given to the hull, lighting, heating, ventilation, and safety, which will make her a most comfortable and luxurious sea craft.

The yacht *Petrel*, built for Vincent Jervis, was also turned out recently from the United yard. The *Petrel* has surprised many of the old-timers in the "Bird" class. So favorably is she thought of that another boat of the same type and lines is started and will be rushed to completion.

A converted naval motor sailer is being remodelled at the shop for Dr. Rohmer and Captain Leb Curtis. This rebuilt craft, which is

ing boats will soon be laid down. They will be 40 feet long and 30 feet beam, with twin screws driven by two 210-horsepower Eastman-Morse diesels, and will be fitted with an Atlas-Imperial diesel engine. They will be built by the Harbor Boat Building Company, San Pedro, and will be the latest work in Union diesel, fully reversible, of 300 horsepower.

of A. Paladini, Inc., San Francisco, is being constructed at the General Engineering & Drydock Co., Alameda. This craft will be powered with an Atlas-Imperial full diesel of 200 horsepower. Her construction is of the highest type, modern conveniences for comfort of crew having been worked into her design, the

Union Gas Engine Company, Oak-land, has shipped to San Diego the 8-cylinder diesel engine for Baron Long's new yacht, building at Campbell Bros. yard. This engine is expected to give the new boat high speed with little or no vibration. The Norab, by which name the vessel is to be known, is believed by her owner capable of making the time between San Diego and San Francisco in thirty hours. In addition to the latest shipment, there are several diesel engines coming through the shops of the Union Gas Engine Co., with prospects good for further business.

W. F. Stone & Son, Oakland, has no new work in progress at present, though some jobs are being figured on. Repair work of an extensive sort is being done on the Humboldt Bay motor lifeboat, which is operated by the United States Coast Guard. When she leaves the yard the staunch craft will be as good as new, in spite of the many years of splendid and trying service she has given. A naval pinnacle is being overhauled at the Stone yard and will be converted into a fishing craft. The Border yacht Northern Light is also at the yard having changes made in quarters and additional deck houses built to accommodate additional guests for this summer's trip to Arctic waters.

Atlas-Imperial Engine Company's shops have lately shipped to Honolulu a 200-horsepower diesel, fully reversible, and a similar one to New York; also a 300-horsepower unit to Portland, Oregon, for a towboat. A duplicate of this is being finished for a new fishing craft being built at San Pedro. One of 375-horsepower, also for a San Pedro fishing vessel, has been shipped south.



Electrically operated, 500-ton floating dock at the Robertson's Shipyard, Alameda, California; Peterson Launch No. 4 up.

Anderson & Cristofani, Hunter's Point, San Francisco, are building for the K. Hovden sardine fisheries at Monterey, a purse seiner 72 feet length, 18 feet beam, and 9 feet depth. She will be fitted with a 4-cylinder 135-horsepower Atlas Imperial diesel. In addition to this job a large service barge is under construction. It will be used at Monterey Bay as a receiving station for fish from the smaller craft.

The one-time rum runner Emma S. is also being completely rebuilt at Anderson & Cristofani's. This craft has an 8-cylinder Dolphin-Sterling engine of high power, and the hull, being long, slim, and finely built, develops speed in plenty. Her interior is completely rebuilt with very comfortable cabins and all requisites of a gentleman's cruiser. Besides this work the yard has been busy on general repairs on bay craft and fishing vessels.

The Marine Engineering department of **The Dahl Electric Company** of San Francisco has lately installed new Mianus engines in Me-

teor and Mermaid. The former has a type 4-16-A with reduction gear, the latter a straight 40-horsepower. Mr. Sylva, manager of this department, reports plenty of work with the outlook good. The firm has been appointed agent for the well-known Buda line of marine engines, the latest installation being an 85-horsepower unit on the new Delta delivery workboat building at Ingersoll's yard, Stockton. She will be operated by the Kern Bakery Co. as a distributing unit for their products to the many Delta landings out of Stockton.

John Twigg & Sons, San Francisco, are building a flock of outboard motor cruisers for local and export trade. Several new developments have lately been made by the firm on these quite popular craft. General repair work on Bay vessels keeps a force of men employed at this yard.

Geo. W. Kneass Co., San Francisco, has just turned out a speed boat for Stanley Dollar, Jr., and



View of the plant of the Harbor Boat Building Company, Terminal Island, San Pedro, taken May 1, 1928.

point of view of a finance house, is that it bears interest hardly ever higher than 7 per cent on the unpaid balance only, with no carrying charge or brokerage. If the paper were good, or the fisherman's credit sufficient for the risk, he could get the money from his own bank and give the engine manufacturer cash. Can he do this? Let him try it.

So, therefore, these good, kind manufacturers, in their imitation of good Saint Nick, have turned themselves into bankers, while Tony and Matso and Joe smile and grin and continue to sit pretty.

And in regard to this method of selling engines, let me quote from a letter sent to me by the head of one of the leading fish packing houses of the United States. The letter is in answer to mine inquiring as to what security is afforded to the engine manufacturer by the purchaser of a diesel engine to be used in a fishing boat.

He says, in part:

"All, or nearly all, of the concerns who build engines for fishermen are now selling them on a basis of 25 per cent or less when the order is signed, the remainder to be paid in eight equal payments over a period of two years. The seller takes the fisherman's note for deferred payments, which note is endorsed by the cannery for whom the boat owner is fishing.

"The principal objection to this method is that some of the canneries are irresponsible, and we think the parties who sell the engines will be in for some heavy losses. We know of some canneries who have endorsed many thousands of dollars worth of notes whom we would not give credit for \$100 for thirty days. Also, this method is likely to increase the size of the fleet to such a point that the catch of the individual boat will grow smaller and smaller, with the inevitable result that fishermen, sooner or later, will abandon the boat as being unprofitable."

Now, concerning the latter contingency that this gentleman suggests—and it has happened many times in the past—one can readily see what a gamble it is to sell a diesel engine on the installment plan today. Assuming, as the fish packer pointed out, that the boat might be abandoned—what provision is made for its ultimate payment? The engine is turned back to the company, and the latter seeks payment from the cannery. The can-

ner, in turn, often repudiates the note, and the manufacturer must either take the matter to court or suffer his loss, or both, and try to dispose of the engine again. And, as every builder knows, to sell a used engine results in great loss. That, in a nutshell, is what the engine manufacturer is up against. True, he might increase his staff by appointment of an admiral, but the banks tried this some years ago when they held the sack. They cannot be tempted again—it would seem that the engine manufacturers could well emulate them.

Another salient point to consider is this statement from one of the oldest and wisest heads in the fish packing industry. "Since 1914, the size of the fleet has increased several hundred per cent, and the cost of fish has increased in the same proportion, while the total catch remains just about the same from season to season."

The business of selling gasoline engines has become so keen that in order to make a sale the builder is virtually at the mercy of the buyer. The latter can demand terms which—if one manufacturer will not grant, another is always just around the corner who will. The result is that cutthroat, disastrous competition has set in that is slowly undermining the entire engine industry. Salesmen in all parts of the Pacific Coast have told me of cases where a Portuguese, Italian, or Japanese fisherman has demanded that as high as \$1200 to \$1500 worth of accessories for a boat be thrown in by the engine manufacturer. When his demands have been refused he had gone to another builder who gladly agreed to the absolutely unsound request. It is not at all unusual at this stage of the game for the engine manufacturer to include in his contract, batteries, generator, and a complete lighting system for the boat.

Try to name one automobile manufacturer who would be so foolish as to equip an automobile with even \$100 worth of accessories in order to make a sale. The very fact that there is a definite factory price for the various types of cars is the principal factor that keeps the automotive industry on its present sound plane.

Another example of how a Portuguese fisherman buys a boat was told to me by the head of one of the largest supply houses in the world. He said that the fisherman usually secures his crew by obtain-

ing contributions from other of his countrymen. The boat is purchased and then the engine is sought. Accessory purchases are always put off until the last because the buyer, by shopping around, is usually able to find the "cutthroat" operator who will be sure to shade off a substantial portion of his profits from the engine in order to add the desired accessories—and make a sale!

The boat, once ready to function, starts out for the fish. When the catch is made the results are distributed among the members of the crew in the form of shares, with a small portion going toward paying for the engine. Often it happens that little remains for the engine manufacturer after all the others have been paid off, and the manufacturer cannot press too hard for payment because the fishermen know that if the engine is taken back the builder will be faced with a definite loss. The upshot of the matter is that the manufacturer takes the mite that is offered him, lets the man keep the engine, and hopes against hope that the next catch will be sufficiently profitable to assure his installment being paid in full.

The "reduction-in-price" evil that I have described is verified by the head of a large marine insurance company, who, for obvious reasons, wishes that his name be withheld. While he echoes the current procedure for making sales as recounted by the fish-packing official mentioned above, he, however, holds that cannery, as a class, are wholly responsible.

And so, Tony and Matso and Joe build their boats well content and unworried. The engine people are good to them, the sun shines and the fish bite. Today they are getting boats ranging upwards to \$60,000 a boat—the engine builder makes them a capital investment and sets him up in business, why should he care, and he doesn't. He dreams and figures on his next boat—when the engine manufacturer will give him a gilded galley stove and gold plated dishes to eat from, as a slight expression of good will for buying his engine.

I do not know what the end will be—but the answer is simple to the problem—a published price, the same to all—standard terms in accord with good banking principles with ample security, the absolute scuttling and throwing overboard of all this "Fishy Finance" and the turning of a game into a business.

Trade Literature

Condenser Tubes—At the request of a most attractive illustration complete issues to the **Worthington Pump Company**. This is a brief exposition of the various condenser tubes and their production by modern engineering methods. It is drawn from the experience and practice of the Worthington Pump Company, having been a half-century. It is available in German, French and Spanish versions. The company before the Worthington Pump Co. of the A. & M. I.

Company has a complete list of the various types of pumps, valves, and fittings of the Worthington Pump Co. of the A. & M. I.

Worthington Pump & Machinery Company has recently issued the following literature which may be obtained free of charge to the A. & M. I.

Technical Bulletin No. 100—Steam Driven Compressors, covering the design and construction of the various types of compressors, with illustrations of the merits and demerits of the various types.

Technical Bulletin No. 101—Horizontal 4-cylinder, double-acting, gas engine compressor, covering the design and construction of the various types of compressors, with illustrations of the merits and demerits of the various types.

Bulletin No. W-613, High Efficiency Ball Bearing Centrifugal Pumps for general service. This is a three-page bulletin, containing illustrations of typical installations, various types of centrifugal pumps, and various types of ball bearings.

Bulletin No. 8-162 is a brief outline of the Angle Gas Compressor Type A.G.C.

Ingersoll-Rand Company, 11 Broadway, New York, attention: Engineering, has a new 44-page bulletin No. 1150—ER and FR compressors and their various types. These are the most modern and efficient machines produced by the company, and are furnished for handling either air or gas. They are of straight-line type and are built as single-stage, two-stage, or three-stage units. ER compressors and vacuum pumps are driven from driving by short or long belt or by direct-connected synchronous motor. FR units are steam driven.

Annual Report of The Commission

on the part of the City of San Francisco.

This is a detailed report for the year 1924, showing the results of the various types of compressors, with illustrations of the merits and demerits of the various types. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types.

Ray Air Compressor—A brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types.

This bulletin describes the various types of compressors, with illustrations of the merits and demerits of the various types. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types.

Busch-Sulzer Bros.—Diesel Engine Co. of New Milford, Conn., has recently published a new first booklet in the series of the new Type I Diesel. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types.

Borden Plans Sea Scout Trip

Lord Borden, owner and owner of the palatial schooner yacht Northern Light, which last year sailed to the Arctic manned by a crew of Sea Scouts, is negotiating for the Alaska Packer sailing ship Star of France for a cruise around the world with a Sea Scout crew, it is reported. The trip is planned for late this year.

Borden, who was highly pleased with the performance of his boy crew aboard the Northern Light, plans to ship 40 lads on the Star of France if the purchase goes through. The boys will be selected

for stand-by and auxiliary service in land plants.

This booklet or catalog, it might be called, is most impressive. Fine full-page half-tone illustrations of this unit from various angles and of its working parts give a very clear and satisfactory idea of the engine. Copies of the booklet may be had on request.

Another beautifully prepared and printed booklet just issued by the **Busch-Sulzer Bros.—Diesel Engine Co.** of New Milford, Conn., is entitled **Large Yacht Diesels**.

Another feature of this booklet is that it gives a full and complete description of the various types of compressors, with illustrations of the merits and demerits of the various types. It is a brief outline of the various types of compressors, with illustrations of the merits and demerits of the various types.

Cork Import Corporation, 363 West 40th Street, New York, has recently issued a bulletin covering applications of its products.

Bulletin 280 covers **Novoid Corkboard Insulation**. This bulletin describes and illustrates the manufacture of cork insulation and its application and installation. This material is used for insulating refrigerated and cool air compartments, also pipe coverings. A table of Novoid corkboard insulation data is included.

The company has distributors in all the principal ports and will gladly send this bulletin or other material to those interested.

by competition from the scout patrols in all parts of the country. The trip will be an educational one for the lads and the first port after Oakland will be Honolulu.

The **Star of France** is one of the more famous of the Alaska Packer fleet. The vessel is an iron hulled craft and was launched in Belfast, Ireland, in 1877. It is one of the first of the iron hulled sailing craft to go to sea and was one of the fastest of her type. She is of 1515 net tons register and is 258 feet long with a beam of 38 feet.



Auxiliaries-Ship Supplies-Marine Equipment

Washington Iron Works Busy

AT the Seattle plant of the Washington Iron Works there is now on the test stand a large Washington-Estep diesel engine for the new double-end screw propeller ferryboat Bainbridge, recently launched for the Kitsap County Transportation Company of Seattle. It is an 8-cylinder, 800-horsepower unit, 17 inches bore by 24 inches stroke, and turns 200 revolutions per minute. The engine is non-reversible and is connected to the bow and stern propeller shafting by one-way clutches with a special interlocking control that throws one clutch out as the other is thrown in, thus driving either the forward or astern propeller as desired. This type of drive has been used for the past three years with a 600-horsepower Washington-Estep diesel engine in the ferryboat Kitsap and has been found very reliable and efficient, due to the extreme simplicity of the entire installation.

The engine installed in the Bainbridge will have an over-all length of 47 feet 6 inches and will weigh approximately 100 tons. The base of the engine is cast in one piece, weighing about 40,000 pounds. The machining of this large casting,



Grinding the bore of Washington-Estep cylinders on the new precision grinder at the Washington Iron Works, Seattle.

which would ordinarily be quite a problem, was easily accomplished on the special large Ingersoll milling machine installed by the company to handle large parts of this type. The cylinders are finished with great precision on an internal grinding machine recently installed, which can be used to grind cylinders up to 36 inches diameter.

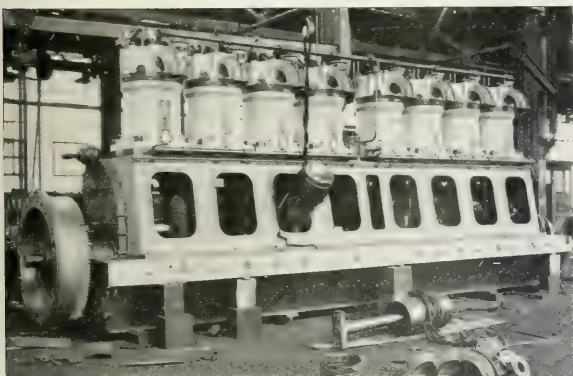
The crank shaft was made by the

Isaacson Iron Works of Seattle, specialists in all kinds of heavy forgings. It is made in two lengths, with cranks and pins solid instead of being built up piece by piece as is usually done on a job of this size, and weighed 17,600 pounds.

After the engine has been tested it will be partly dismantled to facilitate handling and will be lowered into position in the boat at the Smith Cove terminal.

Two 3-cylinder $1\frac{1}{2}$ by $1\frac{1}{2}$ -inch Washington-Estep diesels developing 100 brake horsepower at 325 revolutions a minute are being installed on a 750-ton self-propelled salt barge for the American Salt Company. This barge will operate between the salt works at San Quentin, Lower California, and the refinery at San Pedro. It has a loaded draft of 6 feet and is driven by specially designed Lambie propellers.

W. H. Worden & Co., California representative of the Washington Iron Works, is opening a service station for Washington-Estep engine installation at Terminal Island, San Pedro, and at Madden & Lewis Yard, Sausalito, so that boat repairs and engine adjustments may be accomplished at the same time.



An 8-cylinder, 800 horsepower Washington-Estep diesel engine for the ferryboat Bainbridge, in process of erection on the shop floor.

has branched out in a brand new and up-to-date electrical construction and repair shop located at 115 Steuart street, San Francisco.

Energy and a thorough knowledge of all branches of the marine industrial application of electricity will be utilized in the operation of a factory fitted with modern portable electrically driven machines, insuring rapid and accurate workmanship. All classes of repairs and new construction will be undertaken. Though opened for business but a very short time, the new shop is already busy, as Mr. Toumey's many friends along the "front" know his ability and his habit of getting jobs out on time.

The new establishment will handle the Graybar Electric Co.'s products, this being the new name for the Western Electric Co., one of the

prominent electrical equipment manufacturers of the country. Anything electrical, from a generator or motor of the largest size down to a one-ampere fuse can be obtained from the new establishment, which will be known as the Toumey Electrical and Engineering Co. It is owned and controlled solely by Mr. Toumey, with ample financial backing. No doubt success will follow, as modern system with personal supervision will be a feature of the business. Individually designed lighting for marine purposes, both interior and exterior, will be a specialty of the firm under the personal supervision of Mr. Toumey, whose experience and practical knowledge will thus be of advantage to all naval architects and ship builders.

starter is known to the trade as Cutler-Hammer Bulletin 9115 and is finding wide application for use with fans, pumps, textile machinery, small machine tools, and kindred installations.

Reading Valves

VALVES and fittings which are required to handle the extremely high pressures and temperatures of modern steam application must be of the highest grade material and of good design together with careful workmanship in manufacture. Such a class of goods is made by the Reading Steel Casting Company, Inc., of Bridgeport, Connecticut, with offices and warehouses in San Francisco under the management of C. R. Mendelson. In addition to extra heavy fittings and valves up to 12 inches, a full line of valves designed for 250 pounds working pressure is kept in stock. Larger sizes, up to 16 inches, are also built. A feature of the valves is that they are all trimmed in monel metal, or stainless steel, with special nickel alloy renewable seats where higher pressures are carried. A reasonably priced very good valve for ordinary industrial work is the product of this company, marketed under the name of Pratt & Cady.

Drop forged fittings from ¼ up to 2-inch sizes have lately been stocked, which will carry safely pressures up to 2000 pounds. Steel flanges with the Reading special face, together with all classes of fittings, are stored in quantity, with continual shipments coming in, the call for these goods being brisk.

The Reading products give on an average very much higher test records than are required by American Engineering Standards. For instance, in tensile strength the standard is 70,000 pounds per square inch; Reading averages 78,000, with a correspondingly higher yield point. Percentages of phosphorous and sulphur in Reading steel are less than standard minimum requirements.

To show the high appreciation of these Reading products, it might be mentioned that the new Inter-Island steamer Waialeale was supplied with considerable number of the Reading valves of sizes up to 6 inches, the requirements being such that the highest class of valves was necessary.

A New Alternating Current Manual Starter

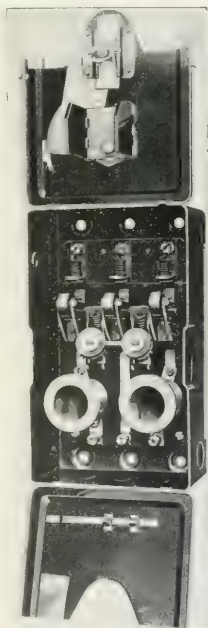
A NEW manual across the line alternating current motor starter is announced by The Cutler-Hammer Mfg. Co., of Milwaukee, Wisconsin. Designed to meet the need for an inexpensive manual starter, it includes such outstanding advantages as overload cutouts giving complete motor protection; cadmium plated, double break, roller type contacts; and a small size, safety, dust-proof enclosing case.

The roller type contacts seem to be the forerunner of an unusual trend in motor control design. They are of the double break type, cadmium plated, and by breaking the arc in two places give several times the life of ordinary contacts. In addition, the contact rollers turn after each operation to present a new contact surface for the next operation.

Complete motor protection is obtained during both the starting and running periods. The thermal overload cutouts provide the necessary time interval to take care of starting inrushes without shutting down the motor.

The starter is quite small and compact, the enclosing case is dust-proof, and the cover is in two parts. This permits opening the lower section only, for replacing fusible links in the thermal overload cutouts. The cover can be opened only when the starter is in the "off" position and all current carrying parts are "dead." Installation can be made

without removing the panel from the case. All parts are easily accessible for quick inspection. This



The new Cutler-Hammer manual alternating current motor starter.

New Flooring for Terminals and Ships

Mastipave as Developed by The Paraffine Companies, Incorporated, of California, Shows Remarkable Wearing Qualities Under Strenuous Usage

SEVERAL years back the Paraffine Companies, Inc. of California began experimenting with the object of producing a durable floor covering that would, at the same time, be reasonable in price, attractive in appearance, resilient, water-proof, and nonskid. The result of this experimentation is known as Mastipave, a patented combination of fiberized mastic fabric and special bitumen cement. This combination, properly laid, has proved of almost unbelievable service under the hardest of traffic conditions.

Strips of this material laid across the state highway at Antioch, California, close to the principal street intersection of that town in September, 1925, are still in good condition, notwithstanding the wear and hammer of millions of transits of automobiles and trucks.

A ramp at the passenger ferry terminal of the Key System Transit Company was covered with Mastipave, and today after the transit of 15,000,000 foot passengers is showing no sign of wear. Several of the ramps at the Southern Pacific ferry terminals have been covered with Mastipave.

In many warehouses and industrial plants of the Pacific Coast Mastipave is proving that it will, with great economy, multiply several fold the useful life of wood or cement floors. In fact when any type of old floor is taken in time and is properly covered with Mastipave its upper surface is hermetically sealed against moisture, corrosion, rot, decay, and disintegration.

One of the more spectacular marine installation in which this flooring has been featured recently is the covering of the exposed decks of the old U.S.S. Oregon, now owned by the State of Oregon and berthed in the Willamette River at Portland where, as a floating museum, she provides much interest for the school children of the City of Roses and for not a few old-timers. The exposed decks of the old battleship are covered with teak, which, lying in the river without proper attention, had become unevenly worn and partly warped. This uneven surface was leveled up with mastic



View on one of the Mastipave covered ramps of Key System Ferry Company, showing part of the 15,000,000 foot passengers who have failed to make an impression on this remarkable floor covering.

and the Mastipave laid on top. The decks of the Oregon are now in condition to preserve the steel supporting structure and to withstand the tramp of millions of enthusiasts in the future generations who shall come to pay tribute to this most famous of Uncle Sam's dreadnaughts.

As a covering for steel decks, Mastipave is an ideal combination. For all ordinary abrasion it will wear as well as the steel. Being moisture-proof and laid in bitumen cement, it positively protects steel decks against corrosion. It takes

varnish well. It can be supplied in several attractive colors, as well as in black. It is resilient, a fair insulator against heat or cold, a deadener of noise, and very sanitary. Neither rats nor mice nor vermin will attack this flooring. It may be swabbed down with a hose, even washed with strong caustic soda without harming its surface.

These properties will recommend themselves to ship operators as very desirable for many locations on shipboard.

New Superheaters on Capital City

THE Foster-Wheeler superheaters placed in the new boilers of the California Transportation Company's steamer Capital City are of the convection type. They take the place of the usual refractory brick baffles which deflect the flames through the tube nests. By being thus placed they absorb great heat and will bring the total temperature of the steam up to around 500 degrees Fahrenheit. This

means a great saving in fuel, and as the steam is dry gives better engine power. It is believed by engineers that this installation will result in considerably more speed at a very great reduction in fuel expense. As this vessel formerly had a totally different type of boiler plant the result of the change will be interesting to engineers and those who operate steam plants both afloat and ashore.



Marine Insurance

Edited by JAMES A. QUINBY

Cargo Claims and Cargo Clauses

THIS article is addressed primarily to consignees of water-borne cargo, with the idea of laying emphasis upon certain details of procedure which should be followed in cases of cargo damage in order that the rights of cargo interests may not be dissipated by neglect or inaccuracy of mechanical details.

Consignees are all too prone to consider themselves protected as to damage, either by the liability of the carrier or the cargo insurer, and thus neglect their duty as to examination, proof, and notice of claim. This lackadaisical attitude results in many claims falling between the devil and the deep blue sea. To the consignee who says,

"What do I care? If my insurer doesn't pay me, the carrier will," there are three answers.

(1) The damage may be of such nature as to relieve both insurer and vessel owner from liability; i.e., inherent vice of the goods or insufficient packing, in which case, Mr. Consignee, you are vitally concerned in establishing your claim against the shipper.

(2) The damage may be caused by some act or neglect of the carrier's agents, such as breakage by rough handling, for which your insurer, under the ordinary marine policy, is not liable. It then becomes vitally important for you to protect your rights against the vessel, which can only be done by taking the proper preliminary steps **immediately**.

(3) Even if the damage is covered by your policy, the ship owner may be liable to you or your insurer. Proper filing of claim against the vessel, and attention to other details, will retain for your insurer his right to recover all or a portion of the loss he has paid you, by proceeding against the vessel under his right of subrogation. Failure to attend to these essentials precludes such recovery by your insurer and directly affects the loss ratio of your account. All insurance, in the last analysis, is based upon experience ratings, mortality tables, or loss ratios. If you can reduce the number of losses under your policy or attain the same result by enabling your insurer to recover a substantial portion of your losses from some other source, the actual cost of your insurance over a period of years will be materially reduced.

For the above reasons, Mr. Cargo-owner, it behooves you to act quickly and intelligently whenever damage occurs. Directly or indirectly, it is your money that is involved.

Seafarers

Tri-masted voyagers—
Tracing the blue—
Heart of Columbus
Beating anew.
Faith of the Nordic men
Braving the jeers
That muffle their oarlocks
Down through the years.

Some who make history
Others who fail—
Cleavers of mystery
Piercing the veil.
Kinship of sea and air
World without end—
Strength to the wings of you,
Seafaring men.

J. A. Q.

What to Do

In order to protect your rights under the policy and the bill of lading, see that certain essential things are done as routine steps in connection with every claim. If you have a good marine broker, you may be in a position to delegate some of these steps to him, but make it your business to see that the following things are done—systematically and invariably:

I. Notify your broker or your insurer of the damage. Do it by telephone and confirm it in writing. All insurers do not insist on written notice, but your system should be designed to anticipate hostility or bankruptcy of your underwriter, especially if you have bought

c.i.f. and are dealing with a foreign insurer through a local agent whose powers are unknown to you.

II. Notify the steamship company, in writing, that you hold them liable for the damage. Bills of lading usually carry a clause requiring that such notice be made within ten days from delivery, or within three days of delivery, or within forty-eight hours after discharge, or even before removal from the dock. Take no chances. Play safe. It's not necessary that you know the amount of the claim when such notice is given, but it is necessary that your letter show clearly and unequivocally that you consider the ship responsible. Writing, "My goods are damaged" is not enough—you must write, "My goods are damaged and I hold you responsible."

A suggested form of letter for this purpose follows:

Steamship Co.

Gentlemen:

S. S. Pussywillow

N. Y. — S. F. — July, 1928.

I hereby file claim upon you for damage to 20 cases Cootie Traps consigned to me by Consolidated Industries under B/L N.Y.—606. Details of damage will be forwarded as soon as amount of same is ascertained.

Yours hopefully,

N. O. DOE.

III. Employ a competent surveyor (preferably one approved by your insurer) in order that the cause of damage may be immediately ascertained. If the damage turns out to be covered by your insurance policy, the insurer will pay the survey fee. If the damage is not covered by the policy, you will have to pay the survey fee yourself, but you will get value received.

"Maybe. And doesn't it strike you as rather pe-

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

09 COLMAN BUILDING, SEATTLE, WASHINGTON

culiar that it should be number 5—the center of the series that is lost?"

"No—that's a normal expectancy, isn't it?"

"Well," said Mort, "let's go down and see what the Katinka people have to say about it."

But we got little additional information. The Katinka's baggage man denied having signed a receipt for ten pieces, but admitted that one of his assistants may have done so. He showed us his baggage book, which he said was made up immediately after leaving Manila, bearing the entry "9 Pc.—H. Martin."

The customs officer and transfer man, interviewed together at Pier 89, corroborated Martin as to the missing trunk.

"Yeah," said the custom's man, spitting accurately through a crack in the wharf, "I remember that egg. We had a lot of trouble with his birds."

"What birds?" asked Mort.

"Oh a bunch of funny lookin' birds with red and green feathers. This lame guy—Martin—had 'em in his cabin in cages."

"Sure," broke in the Katinka's baggage man, "he was always comin' down to the baggage room to get rice to feed 'em."

"Oh—he was, was he," says Mort, in that quiet, dangerous voice used by the best detectives just before they call in all the suspects and announce that the murder was committed by the three-year-old daughter of the author.

So we went back up town and checked up on the rice business. It didn't get us far, though. Mr. Martin waved his hands and explained in voluble German-English that he had to have rice for his birds, which he was importing, and that one of his ten trunks—number ten—in fact, contained breakfast-food for the pets.

Mort stalled him off for another day or so on the plea that the Katinka's people wanted to send a cable to Honolulu to see if the missing trunk might have been landed there by mistake. The cable, however, failed to disclose any trace of Herr Martin's property, and Mort reluctantly prepared to settle the loss.

A day or so later I breezed over to his office in answer to a hurry telephone call, and found him reflectively tearing up a loss check.

"What's all this?" says I.

"This is a check that I almost handed our friend Martin," growls Mort. "Talk about coincidence, read that."

He threw a letter across the desk to me. It was headed "Confidential," and had been written a month before in Yokohama by an agent of the Far Eastern Protective Association:

"C. Gersten, alias L. Bachmann, alias H. Martin," I read. "Be on the look-out for this man. He is lame, rather stout and uses a cane. On voyage from Tokio to Manila, made fake claim for loss of trunk. Previously collected five different claims on successive voyages from various insurance companies. Operates by gaining access to baggage room and putting small trunk inside large one, which has previously been loaded empty."

NOTE: The above incident is based upon an actual occurrence.

A Southern Daniel Come to Judgment

THIS is a practical, concise, and efficient age. Social letters resemble business letters, and business letters resemble telegrams. Even the after dinner speaker, the last survivors of the grandiloquent era, stutters and grows dumb before the baneful effects of cocktails which render his hearers unconscious rather than receptive.

Attorneys are reduced to dealing with facts in place of principles, and even pronouncements from the bench have become contaminated with a lamentable terseness. In the arid midst of this age of efficiency when high-powered six-syllable words are found only in the Congressional Record, it is indeed refreshing to read the opinion of Meekins, D. J., in *Armour Fertilizer Works v. Barge Northern No. 30, 1928, A.M.C. 606* (Eastern District of North Carolina).

We do not know Judge Meekins, but we picture him as a composite embodiment of all the noble graces of the Old South. A man who can extract romance and rhetoric from a general average suit brought by a fertilizer company deserves credit.

The case itself concerned the question originally presented by *Ralli vs. Troop, 157 U. S. 386*, which denied a general average on the ground that the act of a city fire department in extinguishing fire on a moored vessel was not with the consent of the master and, inferentially, was not done for the sole object of saving the ship and cargo.

In the present case, upon somewhat similar circumstances, Judge Meekins finds that the acts of the fire department were done with the consent of the master, and the general average is allowed. It isn't what he says, but how—

His Honor opens upon a somewhat ordinary note, but proceeds to warm up almost immediately.

"This is cause in Admiralty," says he, "and the only question presented was the right of the libellant, a

Balfour, Kessler Agencies Inc.

Marine Insurance Department

Agents for

AMERICAN AND FOREIGN
NORTH CHINA

UNION OF CANTON
QUEENSLAND YANG-TSZE

BRITISH AND FOREIGN
PENNSYLVANIA

SEATTLE
TACOMA

SAN FRANCISCO
OAKLAND
LOS ANGELES

PORTLAND
VANCOUVER, B. C.

JOHNSON & HIGGINS

31 CALIFORNIA STREET
SAN FRANCISCO

*Average Adjusters
and
Insurance Brokers*

SWITZERLAND

General Insurance Co., Ltd.

THAMES & MERSEY

Marine Insurance Co., Ltd.

LIVERPOOL & LONDON & GLOBE

Insurance Co., Ltd.
(Marine Department)

HARTFORD

Fire Insurance Co., Ltd.
(Marine Department)

CANTON

Insurance Office, Ltd.

LOUIS ROSENTHAL

General Agent

302 California Street

Phoenix Assurance Co., Ltd.
of London

Union Marine Ins. Co., Ltd.

Norwich Union Fire Ins. Society,
Ltd.

British & Federal Fire Underwriters

PACIFIC COAST BRANCH

(Marine Department)

114 SANSOME STREET

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MARINE DEPARTMENT

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corporation, to recover contribution in general average. The law of general average is a part of the law of the sea, as distinguished from the law of the land. Perhaps the necessity for such distinction was that there are all shades of ferocity in the vast and cunning sea, which Jean Bart called 'the great brute.' It's the claw's scratch with intervals of velvet pawing. It's never fiercer—the sea—than when a pond—a pool of liquid lead. Gloomy immobility; the prelude to storms, tempests, and hurricanes, which sweep over the face of the waters with the fury of charging Cossacks over the snowcrusted steppes of Russia.

The maxim of the Rhodian law, the foundation of general average did not in terms extend further than to cases of jettison—(Jonah is a chapter in its history)—but the principle applies to all other cases of voluntary sacrifice, properly made, for the benefit of all. The maxim itself is probably an imperfect statement in writing of the principle known to the common law of the seas, illustrating the general principle by a perfect example."

Now Ain't That Nice?

"To say that in these circumstances the service rendered by the fire department was not at the instance of the master of the barge, or without his authority, is to beg the question. Can it be plausibly maintained that because the master of the barge did not stand at strict attention and, with studied inflection and practiced gestures, formally demand or request in so many spoken words assistance from the outside that general average cannot be invoked? As a flash of lightning in the dark reveals what years of daylight have failed to discover to the eye, so in moments of great emergency and excitement actions speak louder than words, because they are more effective. In such moments a request may be made or a command may be given with assurance of certain sudden and swift response by a look or gesture. I do remember me that in my youth when on mischief bent my mother had a way of giving me a certain look. I knew precisely what that signal meant, and it always proved as duly effective as the use of the well-seasoned hickory, which was

her police power, ever ready to enforce her commands. Yet my mother spoke never a word."

By such reasoning, and more of the same, the good Judge comes to his conclusion.

"I am clearly of the opinion that in the circumstances of the instant case if ever equity and policy should apply it is here. Strip this case of its maritime character and equity would cry aloud. If equity and policy are to be denied in the circumstances of this case, then man's law of the sea is not less but more inexorable and cruel than nature's law of the sea, which is governed by the blind forces of wind and wave and in hidden dangers of rocks, shoals, and shallows; if equity and policy and substantial justice are to be denied in the circumstances of this case because it comes under the law of the sea as distinguished from the law of the land, and general average therefore does not arise, then authority for my dissent is Mr. Bumble in 'Great Expectations.'"

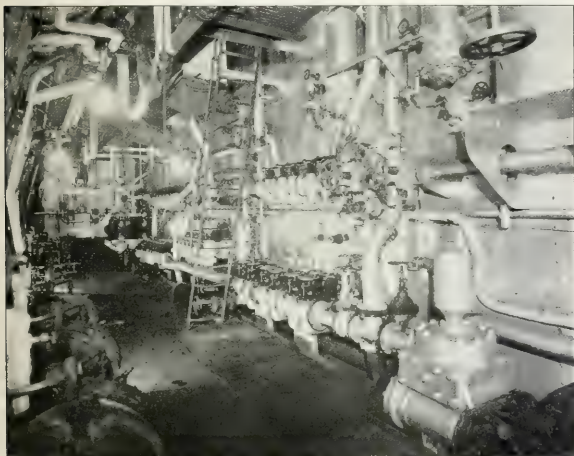
Trade Literature

Needless Ruin is the title of a little booklet recently issued by the American-La France and Foamite Corporation of Elmira, New York.

The object of the booklet is to bring to the attention of those responsible of the protection of ships from the ever-present danger of fire a new Foamite method of generating Firefoam. The method known as the Two-Solution Foamite System has been in use for some time and is well known. A new system has been devised called the Foamite Generator System.

The Foamite generator is a portable fire-fighting apparatus. By its use and with a minimum of weight and space requirements, low initial cost, and practically no maintenance cost, a system can be provided that covers fires in engine and boiler room through fixed piping but which with the aid of hose can cover practically any other point on the ship.

The book should be read with profit by all those who are interested in the latest improvements in safety of ships and docks, piers, and warehouses. It may be obtained from the main office of the company or from any of its branches or agents.



View in the fire room of the U.S.A. transport U. S. Grant, featuring the oil fuel transfer manifolds and multiplicity of valves and illustrating the necessity for precautions against the danger of fire from leaky oil lines.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. G. MacLENNAN

SHIPBUILDING WORK IN PROSPECT

Tacoma Calls for Bids on Fireboat
In accordance with a recently issued bond order of \$111,000 for a fireboat and station, construction of the fireboat at Tacoma, Washington, is being planned. The station is to be located on the waterfront at the intersection of Broadway and Pacific Avenue.

The fireboat is to be of all steel construction, powered with gasoline engine. It is to have a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi, a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi, a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi.

The fireboat is to be of all steel construction, powered with gasoline engine. It is to have a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi, a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi. The sum of \$171,500 available for this work was made the use of a considerable sum for the station of both the fireboat and station and for housing the men.

New Survey Vessel to be Built

The United States Coast and Geodetic Survey has issued plans and specifications from the head office in Washington, D. C., for a new survey vessel. No date has been set for the receipt of bids.

The vessel is to be of all steel construction, 110 feet long, 12 feet 6 inches beam, 12 feet 6 inches draft. It is to have a maximum speed of 10 knots, a maximum pressure of 100 psi, a maximum draft of 10 feet, a maximum speed of 10 knots, a maximum pressure of 100 psi.

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Boat for War Department to be Built

Bids will be opened on June 18 at the office of the Quartermaster, Fort Mason, San Francisco, for the construction and equipment of a small wooden diesel-powered vessel

for the United States Coast and Geodetic Survey in the Philippines Islands. The boat will be of the highest type and have the following general dimensions:

Length overall	44'0"
Length at water line	59'0"
Beam molded	11'0"
Beam loaded	6'0"
Speed, knots	10

The power plant is to be direct-acting, 2- or 4-cycle solid or air injection marine diesel engine or 4 or 6 cylinders, designed to give 120 shaft horsepower. All auxiliaries are to be electric-driven.

Bids Called on Seven Mail Contracts Under Merchant Marine Act, 1928

T. V. O'Connor, chairman of the Shipping Board, has announced orally, after a conference with the Postmaster General, Harry S. New, that the Board has approved selections by the Post Office Department of seven ocean mail routes under provisions of the Merchant Marine Act of 1928. The Department has called for bids, to be opened July 9, for carrying the mails over these routes.

The Postmaster General stated that the seven routes which were approved constitute only a partial list, and other routes will be certified by the Board as soon as practical. The speed of the ships, he said, should be such as to enable the Post Office Department to give preference in assignment of mails in competition with ships of foreign registry.

The routes approved, their present annual volume of mail, the estimated five-year volume in pounds, and the frequency of the routes follow:

No. 1—San Francisco to Sydney, 2,217,859 pounds, 12,198,224 pounds, monthly or oftener.

No. 2—New York to Mediterranean and Black Sea Ports, including Genoa, Alexandria, Piraeus, Constantinople and Constanza, 497,458 pounds, 2,736,019 pounds; weekly or oftener.



Outboard profile of the survey vessel, plans for which have been sent to the shipyards by the U. S. Coast and Geodetic Survey, Washington, D. C.

No. 3—New York to Rio de Janeiro and Buenos Aires, 1,939,140 lbs.; 10,665,072 lbs.; bi-weekly or oftener.

No. 4—San Francisco, via Hong Kong and Manila to Singapore, 491,221 lbs.; 2,701,715 lbs.; bi-weekly or oftener.

No. 5—New York to Cape Town and South African ports, 166,690 lbs.; 916,795 lbs.; monthly or oftener.

No. 6—New York to Valparaiso, 1,661,747 lbs.; 9,139,608 lbs.; bi-weekly or oftener.

No. 7—San Juan, P. R., to Santa Domingo, Dominican Republic, 408,000 lbs.; 2,244,000 lbs.; bi-weekly or oftener.

R. Stanley Dollar has recently been in Washington in consultation with Post Office and Shipping Board officials concerning bids for mail contracts and the plans of the company for ship construction program for five vessels to replace vessels of the Pacific Coast-Oriental service under the favorable conditions of the Merchant Marine Act, 1928.

A ruling was given out by the Postoffice Department and Shipping Board that if the Dollar Steamship Line should be awarded the San Francisco-Hong Kong mail subsidy contract it shall be necessary for the company to build and have ready for operation within three years, one new ship and have two ships available each year thereafter. The vessels required would be of 18 knots speed and of at least 12,000 tons gross.

Matson Company Plans Liners

Plans are rapidly going forward for the construction by the Matson Navigation Company of two 18-knot passenger freight vessels for its San Francisco-Australia service. The original plan of the company was to build three vessels; but it was decided to build two fast vessels to enable the company to bid on the new mail contracts covering the route from San Francisco to Sydney.

New Vessel May Be Built by Inter-Island

On another page of this issue will be found a complete description of the new vessel Waialeale, delivered June 1 by the Bethlehem Shipbuilding Corp., Ltd., to the Inter-Island Steam Navigation Company of Honolulu. The favorable impression that the vessel has made on her

owners and all who have seen her and the fine workmanship turned out by the yard with the efficient supervision and plans turned out by the naval architects and marine engineers of the Matson Company and the Inter-Island company have inclined the owners toward considering the construction of another vessel for the inter-island trade. Plans are of course indefinite; but the growing tourist trade of Hawaii may necessitate additional steamers of the class of the Waialeale at no very distant date.

Tank Barge Planned for Union Oil Company

The Union Oil Company of California, with offices in Los Angeles, of which Albert O. Pegg is marine superintendent, is planning the construction of a diesel powered oil tank barge for British Columbia coastwise service.

Plans Under Way for Whaling Fleet Additions

The California Sea Products Company of San Francisco has announced that plans are not yet ready for publication concerning the enlargements and betterments to the company's whaling fleet. Among the new work planned will be two killer boats to cost about \$175,000 and reconditioning to the company's schooner Port Saunders.

Funds Appropriated for Reconditioning Shipping Board Liners

The Independent Office Appropriations Bill passed at the last session of Congress and signed by President Coolidge carried an appropriation of \$12,000,000 for the reconditioning by the Shipping Board of the steamers Mount Vernon and Monticello. Plans for this work have been drawn up by Gibbs Bros., Inc., 1 Broadway, New York, and are said to entail the entire rebuilding of the interiors of the vessels. The Shipping Board has not

yet announced its intention to proceed with this work.

Export Steamship Corporation Submits Classification Plans Under Jones-White Bill

Classification plans for construction of four proposed 14-knot combination cargo-passenger vessels by the Export Steamship Corporation of New York, for use in the Mediterranean service, and for the construction of which \$10,000,000 would be borrowed from the Shipping Board Loan Construction Fund under the provisions of the Jones-White Merchant Marine Act, were submitted to the Board, June 8, by H. E. Frick, vice president of the corporation.

The vessels each would carry accommodations for 100 first-class passengers, under the plan.

Commenting on the receipt of the plans, the Chairman of the Board, T. V. O'Connor, said it was the first plan the Board has had submitted for the replacement of ships.

"The Board will study the plans," he said, "that should they meet all requirements and be considered practicable in every way, approval will be forthcoming."

In his letter, Mr. Frick stated that the four vessels would be slightly in excess of 8000 gross tons each, and suitable for approximately 5500 tons of cargo. They would be 450 feet in length. Accommodations for approximately 500 tons of refrigerator cargo also are planned.

The machinery would consist of three turbines designed to develop 6300 shaft horsepower, under service conditions, and will be equipped with four water-tube boilers of the straight tube type with a pressure of 325 pounds.

Accommodations for approximately 100 first-class passengers with ample public rooms and deck space for the long Mediterranean voyages are provided in plans.

RECENT SHIPBUILDING CONTRACTS

The Moore Dry Dock Company, Oakland, Calif., has received a contract from the Western Pacific Railroad Company, San Francisco, for the construction of a steel carfloat to cost \$115,000; 258 feet overall; 38 feet beam; 12 feet 6 inches depth; capacity fourteen 80-ton cars.

This yard has also received an order from the Atchison, Topeka, and Santa Fe Railway, San Fran-

cisco, for a steel carfloat 280 feet over-all; cost approximately \$100,000.

Wallace Shipyard, North Vancouver, British Columbia, is building a fireboat for False Creek, under supervision of the City Council of Vancouver.

General Engineering & Drydock Co., Alameda, Calif., has an order for a 78-foot fishing boat for A. Paladini, Inc., San Francisco, to be

completed with 100 days and 30 days. The yard also has an order for the next design 100 foot tugboat for the United States Coast Guard.

J. C. Johnson's Shipyard, Port Chester, N. Y. And also from the Reed Mill Co., Shelton, Wash., for 100,000 ft. of lumber.

Dravo Contracting Co., Pittsburg, Pa. has received an order for ten 100-foot tugs for the U. S. Navy.

Moffatt Barge Company, Seattle, Pa. has received an order for 100,000 ft. of lumber for the U. S. Navy. Also for 100,000 ft. of lumber for the International Petroleum Co., Toronto, for 100,000 ft. of lumber.

The Charles Ward Engineering Works, Charleston, W. Va., Virginia, have an order from the U. S. Engineering Office, Galveston, Texas, for a 100-foot tugboat and a 100-foot tugboat for the U. S. Navy.

Nashville Bridge Company, Nashville, Tenn. has received an order for two 100-foot tugs for the U. S. Navy. Also for 100,000 ft. of lumber for the U. S. Navy. Also for 100,000 ft. of lumber for the U. S. Navy.

REPAIRS

Bethlehem Shipbuilding Corp., Union Plant, is repairing the steamship *Albatross*, Seattle, for the U. S. Navy. Also for 100,000 ft. of lumber for the U. S. Navy.

This plant had the distinction during June of dry-docking at the Hunter's Point graving dock the electric liner *California*. This was the first docking of the vessel since she left the yard.

Bethlehem Steel Company is said to be planning the conversion of one of the New York-South American ore carriers for the intercoastal service of the Calmar Line. The steamship *Cubore* was recently converted to a lumber carrier for this service at a cost of \$100,000. The vessel is now in the yard for conversion.

Bethlehem Shipbuilding Corp., Ltd., San Francisco, was recently awarded contract for repairs to the American-Hawaiian freighter *Mexican*, which struck a reef on her last westbound voyage. Bids submitted were:

General Engineering & Drydock Co., San Francisco, \$98,865 and 35 days; **Hanlon**, \$99,500 and 50 days; **Los Angeles Shipbuilding Corp.**, \$108,650 and 37 days.

The **Los Angeles Shipbuilding & Drydock Corp.** has been awarded the contract for a new cargo barge for the Finkbine-Gould freighter *Manhattan Island*. The vessel will be in service for 100,000 ft. of lumber for the U. S. Navy. Also for 100,000 ft. of lumber for the U. S. Navy.

The **Los Angeles Shipbuilding & Drydock Corp.** has received an order for 100,000 ft. of lumber for the U. S. Navy. Also for 100,000 ft. of lumber for the U. S. Navy.

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Lake Union Dry Dock, Seattle, has received contract to convert the steamship *Zapora* to a freight and passenger vessel, including the installation of a new engine. The vessel is now in the yard for conversion.

The **Moore Dry Dock Co., Oakland, Calif.**, has docked the steamer *Hyades* for bottom damage repairs.

Lighthouse Bureau, Portland, Oregon, has called for bids to be opened July 2 for conversion of the lighthouse tender *Manzanita* from a coal to an oil burner.

SHIPYARD NOTES

The lightship *Columbia*, which has been stationed at the 17th Lighthouse District, Portland, Oregon, will be overhauled as soon as plans and specifications are prepared by Superintendent Robert Warrack.

The **Ben Cope Boat Works, New-**

KEEL LAYINGS

Two carfloats for Reading Company by American Brown-Boveri Electric Corp., May 2.

Lighter 10, 100-ton tugboat for Seattle by Standard Unit Nav. Co., May 10; also tugboat for same May 6.

Light Cruiser CL-39 for U. S. Navy by Newport News Shipbuilding & Drydock Co., May 1.

Two carfloats for Reading Railroad Co. by Staten Island Shipbuilding Co., Apr. 30 and May 1.

Incor. twin screw tugboat for International Cement Corp. by Charles Ward Engineering Works, May 18.

LAUNCHINGS

Tugboat hull for Island Creek Coal Co. by Howard Shipyards & Dock Co., May 14.

Deck barges for Standard Unit Nav. Co. by Nashville Bridge Co., May 22.

Alpha, twin screw tunnel tugboat for Alpha Sand Co. by Chas. Ward Engineering Works, May 16.

DELIVERIES

The **Albatross**, twin screw passenger and freight steamer for Inter Island Steam Navigation Co. by Bethlehem Shipbuilding Corp., May 31.

Crane, patrol boat for U. S. Bureau of Fisheries, Seattle, by J. C. Johnson's Shipyard, May 1; cannery tender to P. E. Harris & Co., Apr. 17; two scows to Libby, McNeill & Libby, Apr. 10.

Eight barges for Mississippi River Commission by American Bridge Co.

Sally H., diesel tugboat to T. L. Herbert & Sons by Howard Shipyards & Dock Co., May 14.

Dump scow to Fitzsimmons Connell Dredge & Dock Co., by Manitowoc Shipbuilding Corp., May 25.

Mileage No. 1 and No. 2 to Warner-Quinlan Co. by Todd Drydock, Engineering & Repair Corp., May 14 and 23.

Tecumseh, to U. S. Engineers, St. Louis, by Chas. Ward Engineering Works, Apr. 28.

The **Colby Steel & Manufacturing Company, Seattle**, has received a contract to build and install elec-

The **Colby Steel & Manufacturing Company, Seattle**, has received a contract to build and install elec-

trically operated crane at the new plant of the Pacific Coast Cement Company. The crane will have a boom of 100 feet long and 60 feet above the face of the dock. It will travel along the face of the dock and will have a capacity of 225 tons of limerock an hour in unloading from steamers.

Gaynor Masters Lumber Terminals has been formed at Tacoma by a group of lumber mills representing nearly all the barging mills in the district. By concentrating their

water business at one terminal it is hoped to gain considerable savings through efficiency, convenience, and economy. The organization has been incorporated and is headed by L. R. Gaynor, Jr., president of the Gaynor Masters Lumber Company.

The Point Hope Marine Railways, Ltd., Victoria, B. C., has been incorporated and plans the establishment of a shipyard for repair work and boat construction on Victoria Inner Harbor.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of June 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length overall; 30' beam; Winton diesel engs.; General Electric motors; keel July 1/28 est.

Hull No. 113, lightship, sister to above; keel July 1/28 est.

Hull 114, lightship, sister to above; keel July 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Three steel dredge hulls for U. S. Smelting, Refinery & Mining Co., Oakland, Calif.; 100x50x11'4"; 6 cu. ft. buckets.

Waialeale, hull 5335, twin screw passenger and freight vessel for Inter-Island Steam Navigation Co., Ltd., Honolulu; 295' L.B.P.; 48' beam; 174½"; loaded draft; 15 knots loaded speed; 1800 D.W.T.; Westinghouse complete expansion geared turbines and electric motors; 4000 S.H.P.; 4 Babcock & Wilcox water-tube boilers; 12-268 sq. ft. heating surface; keel Nov. 15/27; launched Mar. 3/28; delivered May 31/28.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wash.

Crane, hull 125, patrol boat for U. S. Bureau of Fisheries, Seattle; 90 L.B.P.; 20 beam; 13'5" loaded draft; 200 H.P. Washington-Estep diesel engs.; launched Apr. 19/28; delivered May 9/28.

Northern Light, hull 134, twin screw cannery tender for Northern Light Packing Co., Cordova, Alaska; 15 L.B.P.; 13 beam; launched Mar. 20/28; delivered Apr. 18/28.

Hull 135, fish scow for Alitak Packing Co., Seattle; launched Jan. 25/28; delivered Jan. 28/28.

Hull 136, same as above; launched Jan. 8/28; delivered Jan. 11/28.

Hull 137, fish scow for P. E. Harris & Co., Seattle; 60' long by 16' beam; launched Jan. 18/28; delivered Jan. 25/28.

Hull 138, same as above; launched Jan. 18/28; delivered Jan. 25/28.

Hull 139, pot scow for P. E. Harris & Co.; 28'x10'x2'10"; launched and delivered Feb. 9/28.

Hull 140, same as above; launched and delivered Feb. 1/28.

Hull 141, cannery tender for P. E. Harris & Co., Seattle; 76'x18'x8'6"; launched Apr. 5/28; delivered Apr. 17/28.

Hull 142, scow for Libby, McNeil &

Libby, Seattle; 72'x24'x5'6"; launched and delivered Apr. 10/28.

Reed No. 7, hull 152, scow for Reed Mill Co., Shelton, Wash.; 110'x36'x9'11".

Reed No. 8, hull 153, sister to above.

LAKE WASHINGTON SHIPYARDS, Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Bainbridge, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P. 57' beam; 800 I.H.P. Washington-Estep diesel eng.; launch May 15/28 est.

Cannery tender for New England Fish Co., Seattle; 72' length; Washington-Estep diesel eng.; launched.

Purse seine boat for Dick Suryan; 72' long; 180 H.P. Washington-Estep diesel eng.

River boat for Capt. Frank Kern; 60' long.

THE MOORE DRY DOCK CO., Oakland, California.

Purchasing Agent: N. Levy.

Two flat wood barges for Raymond Concrete Pile Co., San Francisco; 110'x34'x9".

Two caissons for Foundation Co., San Francisco; 64' long; 59'6" breadth; 26' high; launched and delivered Apr. 20 and May 1/28.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; delivered Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7".

Six barges for Union Barge Line; 132 x 35 x 10 ft.

Ten covered barges for Carnegie Steel Co.; 175x26x11 ft.

Forty-one barges for Mississippi River Commission; 120x30x7 ft.; 8 completed.

Five sand and gravel barges for Mississippi River Comm.; Memphis; 120'x30'x7".

AMERICAN BROWN-BOVERI ELECTRIC CORP., Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; delivered July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; delivered June 13/30 est.

Hulls 376-377, two carfloats, Reading Company; 250'9" x 34'7"x9" mld.; keels May 2/28; delivered Aug. /28 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel July /28 est.; delivered Dec. /28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel July 28/ est.; delivered Oct. '28 est.

Hulls 281 to 286, inc., carfloats for Pennsylvania Railroad Co.; keels summer /28 est.; delivered fall /27 est.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent, C. H. Hirsching.

Martha E. Allen, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 ft. beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler; keel Dec. 12/27; launch June 9/28 est.; delivered Aug. 1/28 est.

BATH IRON WORKS

Bath, Maine

Vanda, hull 117, twin screw diesel yacht; 240'x36'x22'; two 1500-B.H.P. Bessemer diesel engs.

Not named, hull 118, single screw steel diesel towboat; 43'x10'; 50-B.H.P. Cummins diesel eng.

Boston College, hull 119, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x32'x14'; 400 B.H.P. Fairbanks-Morse diesel engine; keel June 14/28 est.

Holy Cross, hull 120, trawler, same as above; keel June 14/28 est.

Georgetown, hull 121, trawler, same as above; keel June 14/28 est.

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs.

BETHLEHEM SHIPBUILDING

CORPORATION, FORE

RIVER PLANT,

Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse, for Detroit & Windsor Ferry Co.; 156 house turbines and motors; 3000 S.H.P.; launched May 19/28; delivered Aug. /28 est.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, steel passenger and freight steamer for the New England Steamship Company, Newport, R.I.; 202 L.B.P.; 36 molded beam; 14'6" molded draft; 1082 gross tons; 4 cyl. TE eng.; B & W. boilers, coal burning.

Not named, hull 1418, steel passenger and freight steamship for the Pennsylvania Railroad Co., Wes Philadelphia; 300 ft. length; TE engs.

COLLINGWOOD SHIPYARDS, LTD.,

Collingwood, Ontario

Hull 82, hopper barge for Dept of Railways and Canals of Canada; 180 L.B.P. 32 beam; 13 loaded draft; 8 mi. loaded speed; 800 D.W.T., 700 I.H.P. TE engs.; 2 Scotch boilers, 12'6" diam; keel Mar. 21/28; launch June 30/28 est.; delivered July 19/28 est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2903, cruiser for New York yachtsman, 64 ft.; 2-155 H.P. Speedway engs.

Hull 2905, commuter boat for Harrison Williams; 56 ft. length; 2-650 H.P. Wright Typhoon engs.

Hulls 2906-11 inc. 6 play boats for stock. Hull 2912, 68-ft. cruiser for Richard Hellman; 2-170 H.P. Speedway engs.

Purchasing Agent: S. C. Wilhelm.

Twenty steel hoppers cargo barges for Magdalena River, Colombia; 125'x26'6" ft.; 15 delivered.

Stern wheel towboat for South America; 170'x42'5" ft.; keel Jan. 1/28; delivered Apr. 9/28.

Stern wheel towboat for South America; 170'x42'5" ft.; launched.

Oil barge, sternwheel oil barge for Tropical Oil Co.; 203'x44'5" ft.; 6'.

Hull 235, sister to above.

MIDLAND BARGE COMPANY Midland, Pa.

Not named, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x5 ft. 6 in.; steam tandem comp. eng. 14"x28"x7" stroke; keel March 1/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6'6".

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6".

One steel barge for P. M. Adema, Pointe a la Hache, La.; 120'x36'x6 ft.

Four dump scoops for Div. of Canals and Waterways, State of New York; 100'x28'x7'6".

Six deck scows for Div. of Canals and Waterways, State of New York; 75'x25'x5'6".

Forty discharge pontoons for U. S. Engineers, Rock Island, Ill.; 38'x14'x3'.

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7".

NASHVILLE BRIDGE COMPANY, Nashville, Tenn.

Purchasing Agent, Leo E. Wege.

Hull 142, tug for stock; 44'x9'6"x4'3"; 80 HP Worthington diesel.

Hull 144, for International Cement Co.; 180'x40'x9'6"; keel Apr. 2/28; delivered May 23/28.

Hull 145, same as above.

Cathrine D. hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P. diesel engs.; keel May 15/28.

Hull 147, deck barge for Standard Unit Nav. Co.; 49'x16'6" ft.; keel Feb. 27/28; launched May 12/28.

Hull 148, hopper barge for Standard Unit Nav. Co.; 49'x16'6" ft.; keel Feb. 29/28.

Hull 149, towboat for Standard Unit Nav. Co.; 92'x24'5" ft.; keel May 10/28.

Hull 150, deck barge for stock; 120'x30'x6 ft.; keel May 6/28; launch June 15/28 est.

Hulls 151-152, two deck barges for stock; 100'x24'5" ft.

Hull No. 153, dredge hull, 100'x30'x4'; keel June 17/28 est.; complete July 11/28 est.

Hull 154, deck barge for stock; 120 L.B.P.; 30 beam; 7 loaded draft.

Hull 155, same as above.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft.

Hull 161, ferry hull for stock; 150 L.B.P.; 62 beam; 8 loaded draft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement keel Aug./28 est.; deliver Mar. 13/31 est.

Yorktown, hull 325, bay steamer for Chesapeake Steamship Co.; 277' long, 53' beam, 18' depth; 2700 I.H.P.; 4-cyl. T. E. eng.; coal burning Scotch boilers; keel Sept. 28/27; launched Feb. 25/28; delivered May 17/28.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launch Aug. /28 est.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr.; 1200 gross tons.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18 1/2 mi. speed; 1784 gross tons 2600 I.H.P., 4-cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27; launched Feb. 6/28; deliver July 1/28 est.

Not named, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 103' L.O.A.; 24' beam; 13'9" molded depth; keels June 20/28 est.; launch Aug. 1/28 est.; deliver Sept. 1/28 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.

General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel June /27; deliver June /28 est.

Not named, hull 2, screw double-end

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TODD DRY DOCKS INC. Seattle, Wash.

U. S. NAVY YARD Bremerton, Wash.

Pennsylvania, William Jones, Henshaw, Sinclair, Eagle No 38. Misc repairs. Perceval. Misc repairs incidental to operation as distinct craft Mahopac, Swallow, Challenge, Pawtucket, Sotomomo.



Trade, Traffic, and Shipping

Handling and Shipping Materials on Skid Platforms

ON JUNE 6 there was held at the Department of Commerce, Washington, D.C., a conference of shippers, carriers, and warehousemen at which the following interesting information developed:

Skid platforms, commonly called "skids," have for many years been used for handling and storing goods in and around individual manufacturing plants, warehouses, and terminals. The practice of shipping goods on skids from plant to plant was initiated a few years ago by the paper and pulp industry, and within a relatively brief period has been taken up by shippers of other commodities, such as sacked goods, sheet steel, automotive parts, and railway stores. Within the past two years this practice has grown rapidly and has spread to numerous other commodities; but its growth has been handicapped by the great diversity in dimensions of the necessary equipment.

It is estimated that about nine million "dead" skids (without wheels or casters) are now in use. Probably 85 per cent are plain wooden skids, made in carpenter shops or shipping rooms of the plants where they are used. The balance, usually of a more substantial and permanent type, are made by manufacturers specializing in this equipment and are more or less standardized. Skids are moved by lift trucks, hand or electrically operated. Estimates indicate about 90,000 hand lift trucks and 8,000 electric lift trucks now in service. Total capital now invested in this equipment is estimated at \$75,000,000, and present annual production at \$16,000,000, the latter not including skids made by users.

Estimates made by the American Society of Mechanical Engineers and by manufacturers of materials handling equipment indicate that the direct cost of materials handling in the United States now approximates \$3,500,000,000 a year. Of this

amount, \$700,000,000 is estimated as the cost of handling, loading, and unloading goods which can be shipped on skids. No estimates are available of the direct cost of loading and unloading such goods when shipped by rail, but traffic officials of one large railway system have furnished figures covering a considerable range of ordinary commodities, which show that an average ton can be carried from 500 to 700 miles at a freight cost no greater than the cost of loading and unloading that ton. This proportion has been enormously reduced in certain industries by the use of skids and lift trucks. One paper and pulp company saved 77 per cent on cost of packing material and 80 to 90 per cent on labor cost by shipping its product on skids. One large railway system adopted the skid and truck system for its own stores, including shipping such material between stores points. As a result,

the number of cars used in this service was reduced 55 and the labor cost 65 per cent.

Detailed figures secured by equipment manufacturers from users of lift trucks and skids show direct savings ranging from 25 to 90 per cent in cost of packing, handling, loading, and unloading. No comprehensive survey of these operations has ever been made; but opinions expressed by shippers and railroad officials who have used this method of shipment indicate possible savings from \$200,000,000 to \$500,000,000 per year. In order to accomplish such savings, national standards of dimension are essential. Skids must be standardized as to height and distance between supports. Lift trucks must be similarly standardized as to height and width of lifting platform. Over-all dimensions of skids must also be standardized for economical packing in railroad cars. Thousands of



View at the quayside, Newcastle-on-Tyne, England, featuring the new, recently dedicated, high-level, arch bridge said to be one of the largest of its kind in the world. Note the many methods of transport; hand truck, horse dray, steam lorry, and gasoline motor truck all serving the same cargo steamer.

Photo by courtesy of Newcastle Chronicle.

firms now using skids for inside handling in their own plants could and would receive and ship goods on skids if even a reasonable degree of interchangeability existed.

While the principal savings from this method would accrue to shippers, the railroads would also benefit largely, entirely apart from savings made in handling their own stores and supplies. Records in the paper, tin plate, and other industries show that box cars are now unloaded in 60 to 80 per cent less time if the load is on skids, thereby releasing the cars for other service with less loss of time. This is particularly important in the case of the automotive industry and other large industries where a steady flow of material is essential. In certain commodities, also, it has been found possible by loading on skids to secure better packing in cars, less liability to shifting in transit, and heavier average loading per car. This has been particularly evident in the case of sheet and tin plate.

The manufacturers of skids and lift trucks are unanimously in favor of establishing national standards of dimensions. Four of the largest companies have each stated without reservation that they stand ready to change any or all present standards if necessary to conform with national standards. It happens that the nine manufacturers of electric lift trucks have standardized height and width of platforms to a considerable extent, over 90 per cent of their present production being held to a height of 11 inches and platform width of 27 inches. Hand lift trucks vary considerably as to height, ranging from 4 inches to 11 inches; but a majority are 7 inches high in the lowered position. Platform widths are fairly well standardized, being either 18 inches or 27 inches maximum. So far as the lift truck alone is concerned, overall dimensions of skids are relatively unimportant, but for economical packing in cars, these dimensions are of prime importance. Manufacturers believe that it will be possible to handle the great majority of commodities on skids of not more than two or three sizes. If such sizes can be multiples, the problems of warehousing and stacking will be enormously simplified.

In the case of skids, enormous diversity exists at present, but this applies mostly to skids made by users. A certain range of standard sizes is used by the few manufacturers of skids, all of whom

strongly favor reduction to as few sizes as possible. With the exception of the products of such manufacturers skids are mostly cheap and short-lived and represent a relatively small investment to any single user. The adoption of national standards would result in gains far exceeding any temporary loss due to changing or discarding old skids. The transition from current practice to standard practice would be gradual in the case of skids, and in many cases would involve no loss whatever.

The problems of returns and exchanges will in any event have to

be met sooner or later, as the practice of skid shipment grows, but it will be infinitely easier of solution if the great bulk of equipment can be used interchangeably. Lack of interchangeability is a major factor in holding back the spread of this method of shipment. With this handicap removed, our industries can reap the full benefit of a practice which even now is growing fast and paying dividends in spite of all handicaps. Any saving in the cost of handling materials is a net gain. Materials handling, as distinct from transportation, adds to cost, but adds nothing to value.

Freights, Charters, Sales

June 14, 1928.

THE following vessels are reported fixed with grain from the North Pacific to U.K.-Continent: British str. Mabriton, Vancouver to U.K.-Cont., 25/9, option Rotterdam 6/- less, June, Strauss & Co.; British str. King, Vancouver to U.K.-Cont., 26/6, Antwerp or Rotterdam, 26/-, June; British m.s. King James, Vancouver to U.K.-Cont., 26/-, June; British str. King Robert, Vancouver to U.K.-Cont., 26/-, June; British str. Anglo Australian, Vancouver to U.K.-Cont., 26/-, option Antwerp or Rotterdam, 26/-, July, Canadian Cooperative Wheat Producers Asso.; Japanese str. Portland Seattle to U.K.-Cont., 29/6, Aug.; British str. Leeds City, same, 28/9, June July, Edward L. Eyre & Co.; Japanese str. Portland Maru, Portland to two ports U.K.-Cont., 28/9, July, Kerr Gifford & Co.; British str. Rio Blanco, Portland to U.K.-Cont., 28/6, July, Balfour Guthrie & Co.; British str. Wentworth, San Francisco to U.K.-Cont., barley, 30/-, July/Aug., Edward L. Eyre & Co.; British str. Vancouver to U.K.-Cont., 26/-, July; British str. Anglo Peruvian, same, 26/6, July/Aug., Simpson, Spence & Young; British str. Bradclyde, same, 26/-, July, J. W. Mitchell, Ltd.; British str. Brighton, same, 26/-, July, Simpson, Spence & Young.

The British str. Glenmoor is reported fixed with lumber and case oil from San Francisco and Grays Harbor to Sydney by American Trading Co. and the Norwegian str. Kalfarli, also with lumber and case oil, from San Francisco and North Pacific to Australia, June loading, by J. J. Moore & Co.

The Japanese str. Ishin Maru is reported fixed with lumber from

Coo's Bay and Grays Harbor to two ports in Japan, \$40,000, by Yamashita Shipping Co. and two Japanese str. Buyo Maru and Malta Maru from North Pacific to the Orient, June loading, by Yamacho & Co.

Two lumber fixtures to the Atlantic are reported: British str. Baron Saulton, British Columbia to Montreal, \$14.25, July/Aug. loading, and an unnamed str. from North Pacific to U.S. north of Hatteras, \$13, June July.

A Smith steamer is reported fixed from the North Pacific to U.K. with ties, at a lump-sum of £12,000, June July loading.

The British m.s. King Arthur is reported fixed from the North Pacific to South Africa with lumber and general merchandise, June July loading, J. J. Moore & Co., Inc.

The following tanker fixtures are reported: American tanker M. F. Elliott, San Pedro to north of Hatteras, 85c, June 25 cancelling; American tkr. Hadnot, same, 82c, early July loading; American tkr. Helen Vinmont, California to Japan, about 50c, June loading (rate unconfirmed); American tkr. N. H. Tilford, California to north of Hatteras, 85c, July.

The following time charters are reported: British m.s. Innesmoor, del. Colon, redelivery Australia via North Pacific, \$1.50, J. J. Moore & Co., Inc.; British m.s. Vinemoor, 5/7 mos., delivery Los Angeles, June, redelivery Australia, \$1.50, H. R. MacMillan Export Co.; Italian m.s. Ansaldo San Giorgio II, 1 trip, del. Philadelphia, redelivery U.K.-Cont. via North Pacific, May, W. L. Comyn & Co.; British str. Dunrobin, 1 trip, delivery and redelivery north of Hatteras via North Pacific, 73c;

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quille River bar and entrance, \$100,000; Umpqua River and entrance, \$100,000; Willamette River below Vancouver and Portland, \$1,366,000.

Washington: Puget Sound and tributaries, \$125,000; Bellingham Harbor, \$25,000; Chehalis River, \$211,500.

Alaska:—Port Alexander, \$17,000; Harbor of Refuge at Seward, \$85,000; Ketchikan Harbor, \$272,000.

Hawaii:—Honolulu Harbor, \$775,000.

Grays Harbor, Washington. Major General Edgar Jadwin, chief of Army Engineers in the Washington district, has recommended that Grays Harbor and the Chehalis River be improved to provide a channel 18 feet deep and 200 feet wide from deep water in the bay to Cosmopolis, and a channel 16 feet deep and 150 feet wide hence to Montesano. The estimated cost is \$423,000 of which the local interests must pay half, as well as all of the maintenance and provide a suitable public terminal at Montesano.

Portland:—Contracts have been awarded by the Commission of Pub-

Pacific Port Improvements

The House of Representatives passed the Rivers and Harbors Bill before adjournment. It is expected to pass the Senate and become law. The bill provides for special assistance to meet the growth of shipping. It is hoped, however, that the bill will be considered early in the next meeting of Congress and will be acted upon early.

While the two major projects considered under the bill are the deepening of the Great Lakes for shipping and the development of the Mississippi transportation system, several projects of a lesser nature but of great importance to shipping on the Pacific were under

consideration. One of these is the project to deepen the channel of the Columbia River between Portland and the sea to a depth of 35 feet. Appropriations included in the bill for river and harbor improvements and for maintenance of present improvements on the Pacific Coast are as follows:

California:—San Diego Harbor, \$120,000; San Francisco Harbor, \$1,284,000; Richmond Harbor, modification; Suisun Bay, \$38,000; Redwood Creek, \$26,000; Petaluma Creek, \$185,000; Humboldt Harbor and Bay, \$92,000.

Oregon:—Coos Bay, \$125,000; Skipanon Channel, \$135,000; Co-

lic Docks for the construction and equipment to augment the existing grain elevator facilities at Terminal No. 4.

Seattle:—Improvements to grain-handling facilities at the Hanford Street Terminal to cost approximately \$12,000 have been approved by the Port of Seattle Commission and will provide an extra loading berth and facilities for loading.

Bids were opened by the U.S. Army Engineers recently for the dredging of the Duwamish Waterway to widen and deepen this ship channel to open up navigation to deep water vessels up to 14th Avenue South and thereby develop a large industrial area. Low bid was submitted by the Puget Sound Bridge & Dredging Co., Central Bldg., Seattle, at 12½ cents a cubic yard, involving 1,014,300 cubic yards dredging with 91,700 cubic yards overdepth; the latter to be paid for at half price.

The Seattle Pulp and Paper Mills, Inc., has been organized with an authorized capital stock of \$2,000,000, and plans the construction of a plant on the Duwamish Waterway. Joseph Irving of Everett is president; E. K. Worthington of Seattle, treasurer; Allen B. Engle is secretary.

Among the federal improvements authorized and funds appropriated for Seattle at the recently closed session of Congress is a sum of \$485,000 for buildings and improvements at the Sand Point Aviation Depot.

Emeryville, California:—The City Council has granted the Union Oil Company of California permission to install pipes for pumping petroleum products from the foot of Powell Street (at shore of San Francisco Bay) to the site of a proposed half-million dollar plant at Green and Pelandean Streets.

San Francisco:—The Southern Pacific Company is preparing to ask permission of the War Department to construct a bridge across Carquinez Strait. The building of this bridge will cost about \$10,000,000. The railroad company now operates large car ferries across Carquinez Strait, which carry the engines and cars of the main overland trains of the company. The projected bridge would be over a mile long, will have a center lift span 327 feet long which can be elevated to 135 feet above high water level. The normal height of the bridge will be 70 feet over high water level.

The Board of State Harbor Com-



A busy harbor tug.

missioners recently awarded contract to A. W. Kitchen on a bid of \$62,677 for construction of wharf and buildings between piers 26 and 28.

Jose Piasecki, San Francisco, was recently awarded contract by the Harbor Commissioners for building shed and resacking bins at the Is-

lais Creek Grain Terminal, to cost \$57,823.

Alameda, California:—The Interstate Commerce Commission has authorized the Alameda Belt Line to issue \$500,000 of common stock, half the proceeds of which will be used for improvements.

Ventura, California:—Engineers have completed a survey of the Coast Line of Ventura County and will shortly submit to the Harbor Commission a report on the best location for a port. Captain Leonard M. Cox of San Francisco is consulting engineer in charge of the survey.

Los Angeles:—Merritt, Chapman & Scott Corporation were successful bidders at a price of \$27,320 for removing 74,000 cubic yards of earth in the inner channel of the harbor to deepen certain slips to 30 feet.

San Diego:—A new pier for the Navy Department at San Diego will be started this month. Captain George McKay, public works officer of the Eleventh Naval District, is in charge of the work. This is the first unit of a \$1,000,000 project and will be 484 feet long, 60 feet wide, and will cost about \$250,000.

Ship "Star of Scotland"

(Continued from Page 297)

bury again put about, this time for Rio de Janeiro, and after arrival there he resigned his command. Such of the original crew that had not left the ship at Montevideo also quit at Rio. Captain J. E. Sewall was sent out from Bath and after he had had the ship dry-docked, cleaned and repaired, he also left her. Captain William Taylor, who had succeeded Captain Baker in 1898, was then sent out, took command and sailed from Rio December 17, 1907. In latitude 43 south a hurricane was encountered which lasted two days. The cargo shifted, and the ship lay over on her beam ends until the deck house eaves were under water. The cabins were flooded, lifeboats smashed, and sails blown away. It appeared as though the Kenilworth was destined never to round Cape Horn again. However, after the weather moderated, all hands were set to work retrimming the cargo and this was successfully accomplished after seven days of very hard labor. From that time until arrival at San Francisco nothing but fine weather was ex-

perienced and the royals were not touched after the parallel of 53 south was crossed. The ship arrived in port March 16, 1908, 579 days from Philadelphia, 90 days from Rio de Janeiro.

The Tragedy of the Kenilworth

The Kenilworth sailed from San Francisco March 30, 1898, for Hilo, Island of Hawaii, to load sugar for New York and arrived at the island port April 14. Captain J. G. Baker was in command, his first mate being Arthur B. Piper and his second mate Victor H. Generaux who had been promoted from boatswain at San Francisco. The crew were of all nationalities and were troublesome on the passage down. At Hilo they refused to work cargo. Some two weeks before the ship had completed loading the carpenter discovered a fire in the sail locker and it was extinguished by natives. The crew were sent to jail where they were kept until the ship was ready for sea when all but three, who succeeded in deserting, were returned to work.

On July 8, at 3 p. m. when the

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PLEASE MENTION PACIFIC MARINE REVIEW

ship was in latitude 46 south, longitude 116 west, chief officer Piper saw smoke coming from the poop ventilator and the cargo of sugar was found to be on fire. The fire was soon ascertained to be of a serious character and Captain Baker decided to bear up for Valparaiso, about 2500 miles distant. The ship's course was altered to N.E. $\frac{1}{4}$ N.

At midnight second officer Genereaux called Mr. Piper to relieve him but there was no response from the mate's room. Mr. Genereaux then went into the cabin and found the odor of gas very strong in the passageways, the doors of the cabin being closed on account of the cold weather. Mr. Piper was found dead in his berth and on the floor of his room lay the dead body of Henry W. Hobson, the ship's boy. Captain Baker lay dead in his berth with a smile on his face. Mr. Genereaux, almost overpowered by the fumes from the burning sugar, managed to get out on deck the unconscious form of a passenger, G. Ernest Thrum, who was found on a settee in the after cabin. It was not until 6 a. m. the following morning that efforts to restore respiration were effective and Mr. Thrum was brought back to life. Later in the day he was able to read the burial service over the bodies of his three former shipmates.

Mr. Genereaux was acting captain for sixteen days, sailing the ship 2500 miles into Valparaiso where the fire was extinguished. The old crew, who may have set the ship afire, deserted. Captain James Murphy, formerly in the big ship Shenandoah, was sent out from the East to take command and, as heretofore stated, he sailed the Kenilworth from Valparaiso to New York in the remarkably fast time of 65 days.

Exit Kenilworth. Enter Star of Scotland.

After her arrival at San Francisco in March, 1908, the Kenilworth was laid up at Sausalito for some months, after which she was advertised "on the berth" for New York in Bates & Chesebrough's Shippers Clipper Line. She did not load, however, but was sold to the Alaska Packers Association, who had her name changed to Star of Scotland. In April 1909 she left San Francisco for Loring, Alaska, and thereafter each spring took her departure for some plant in the Far North. Returning to her home port in the fall of the year, she was well laden with canned or pickled salmon, fishermen, and cannery laborers. Since her passage down from Bristol Bay in August 1926 she has been laid up at the company's warehouses in Alameda.

Royal Mail Declares Dividend

THE following facts and figures are taken from the address of Lord Kysant, chairman of the Royal Mail Steam Packet Company, at the Eighty-seventh annual meeting of that company:

"The Royal Mail Steam Packet Company and its associated shipping companies together own more than 500 vessels of all descriptions, aggregating over 2,700,000 gross register tons.

"As exemplifying the magnitude of the operations of the Royal Mail and associated shipping companies, you may be interested to know that during the year 1927 their vessels carried 1,396,000 passengers and 13,896,000 tons of cargo. They covered 19,944,000 miles, and made 75,800 entries into ports, while the average number of men employed on board ship was 35,500, and the shore staff numbered 22,900.

"We were among the first to adopt the motor engine for the propulsion of our vessels, having first acquired a motor-ship 12 years ago.

We have today no less than 62 motor vessels of over 340,000 tons gross register. Our experience of operating motor-ships to and from many parts of the world has satisfied us as to the suitability and adaptability of motor vessels for a large number of trades.

"The results for the year 1927 may be regarded as not unsatisfactory, having regard to the fact that the circumstances prevailing in the shipping industry, and particularly those of the South American trade, continued to present many adverse factors.

"On the whole, the results show a decided improvement over the previous year.

"After making provision for taxation, Debenture interest and Preference dividends, and writing depreciation off the fleet, we recommend the payment of a dividend on the Ordinary stock which, with the interim dividend already paid, makes a dividend for the year of 5 per cent, less income tax."

The Royal Mail Steam Packet Company is extremely conservative. Twelve per cent of its fleet is now diesel driven and it is satisfied with diesel performance.

After making a decided improvement in results, the company is happy to be able to pay a dividend on the common stock of 5 per cent, less income tax. To have done this under conditions now existing in ocean transportation and to have kept 58,400 individuals gainfully employed in that business is an achievement of which any company may well be proud.

Chinese National Marine

THE China Merchants Steam Navigation Co. has been taken over by the Nanking Government. The value of this company's 27 steamers, together with its wharves, warehouses, and other property in Shanghai and elsewhere in China, is estimated at 40,000,000 taels (about \$25,000,000). Against it are mortgages and loans amounting to 13,000,000 taels. (approximately \$8,000,000). While the company was organized originally to trade between Chinese ports not open to foreign commerce, their operations never were limited to such ports. They have run boats for years on regular schedules between the larger treaty ports. The Nationalist Government contends that it has not taken over the line, but is merely engaged in reorganizing a valuable national asset which has fallen somewhat on evil days. For some time past the company has been handicapped by seizure of ships at will by the military of various factions. Labor troubles, damage and general deterioration of ships also have rendered operations difficult, and in conjunction with general loss in business has made it practically impossible for the company to maintain regular schedules on the more profitable runs. Mismanagement, leakage and antiquated equipment combined with inability or lack of desire to reorganize on an efficient, paying basis are understood to have prompted the taking over of the company in order that reorganization on a profitable working basis might be effected.—(China Trade report, Department of Commerce, May, 1928.)

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Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

Presentation of a bell from the old three-masted side-wheeler **Golden Gate**, which sank off Manzanillo in 1862, was made recently to **Captain Robert E. Judson**.

The relic is from the historic old side - wheeler, which was one of the pioneer ships of the old Pacific Mail Steamship Company operated between California and Panama. The bell was salvaged during dredging operations off the port of Manzanillo and was tendered to Captain Judson by **Colonel John Beveridge**, a mining operator of Mazatlan.

The Dollar Steamship Line is awaiting sanction of a bid for carrying the mails on its transpacific and around - the - world service. **R. Stanley Dollar**, vice-president and general manager, is expected to return from Washington shortly where he has been in the interest of the mail subsidy and in connection with the building of new tonnage for the transpacific service of the company. Mr. Dollar was informed that in the event that the mail contract was awarded, his company would be required to construct one new ship to be ready within three years and new ships ready every two years thereafter. These vessels will have to maintain a steaming speed of 18 knots and be of 12,000 tons. The same qualifications apply to the Matson Navigation Company in the San Francisco-Australian service via the South Seas.

E. Grant Rowley, one of the oldest engineers in point of service on the Pacific Coast, is remaining shoreside for one round voyage of the Panama Mail liner **Corinto**. Chief Rowley stated that he was going on an extended fishing trip to the Feather River country.



Captain Robert E. Judson of the Panama Mail liner **Colombia** with his dog and the ship's bell of the old side-wheeler **Golden Gate**.

Chief Engineer Ernest Prince, in a communication to the Pacific Marine Review, states that 50 per cent of the passengers traveling on the palatial liner **California** of the



F. R. Weeks, recently appointed assistant general agent of the **Nelson Steamship Company**.

Panama Pacific Line visit the engine room of the greyhound during the voyage between New York and San Francisco. Universal interest in this new type of noiseless and vibrationless ship has created a general desire on the part of her passengers to see her propelling machinery. As a social event, an after-dinner visit to the engine room takes first place on the list with passengers on the coast to coast voyage.

A visit to the engine room of the express liner **California** has a real thrill for the visitor, and an element of surprise as well, which delights the average seagoer, accustomed, through long habit, to associating the thought of engine rooms generally with noise, thumping, and oil spatters, not to mention the oily rails of iron ladders down which one was expected to lower oneself cautiously to the mechanical depths. On the **California** an elevator lowers the passengers to the operating platform level. There is no noise. The enormous rotors within the shells of the main driving motors revolve as silently as the works of a watch.

Another element of surprise to the visiting passengers is the temperature. It may be up in the nineties in the outer, tropic world, but in the engine room it is in the seventies and there is a real movement perceptible in the air.

A recent report of the **Bureau of Navigation, Department of Commerce**, shows that the days of "wooden ships and iron men" is on the wane in a manner to cause regret among those valiant old skippers who trudged the quarter deck of the American clipper in the days when "full and by" craft were the medium of ocean commerce.

To-day, according to the report, the sailing ship tonnage is only slightly above that which it was in George Washington's time. From about half a million tons in 1776 American sailing tonnage rose rapidly in three-quarters of a century to almost 4,500,000 tons in 1858.

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when the famous Yankee clippers carried the bulk of America's water-laden tonnage on the seven seas. As a comparison, in steam vessels, the United States with 13,873,720 gross tons ranks second to Great Britain, which is supreme with a total tonnage of 20,612,487.

After spending several months on the mainland, E. D. Tenney, chairman of the Board of Directors of the **Matson Navigation Company**, sailed for Hawaii recently, accompanied by **William H. Roth**, president of the company, who will spend some time in the Islands.

The Portland office of **Alexander & Baldwin** is now in charge of **R. C. McDonald**, formerly manager of the **Matson Navigation Company's** headquarters in Seattle.

Harry B. Penewell, assistant paymaster at Seattle for the **Matson Company**, married **Miss Georgia Baxter**. The couple spent their honeymoon in California.

John D. Maloney, formerly connected with the **General Steamship Corporation**, is now assistant to **M. F. Cropley**, assistant freight traffic manager of the **Matson Navigation Company**.

Harold De Golia, one of the best known steamship passenger men on the Pacific Coast, has been assigned to the Los Angeles offices of the **Matson Navigation Company** as assistant general agent. Mr. De Golia joined the **Matson Company**



James Sager, popular chief steward of the Dollar Line.

when the **Oceanic Line** was purchased. He was connected for many years with the **Cunard Line** in San Francisco under **Arthur Sweazey**.

George De Beaumont is also now in the Los Angeles office, taking the place of **Howard Burgert**, who is ill.

Another appointment of interest, especially among San Francisco and Portland steamship men, was the selection of **Earl D. Walker**, to work out of the Chicago office of the

company as traveling passenger representative. Mr. Walker was formerly connected with steamship companies in Portland and San Francisco.

Adolph J. Pessel is the new secretary of the executive offices of the **Matson Navigation Company**, succeeding **Sidney G. Walton**, who has been appointed secretary of the **Oceanic & Oriental Navigation Company**.

It is reported that 1550 tons of live oak have been shipped from **Commodore's Pond**, Pensacola, Florida, to the Boston Navy Yard for the rebuilding of the U.S.S. **Constitution** (Old Ironsides). This oak timber, placed there for use in building wooden warships, has been submerged for seventy-two years.

Captain B. Aillet, Pacific Coast manager of the **French Line**, is expected to return from Paris the middle of this month. He has been attending a conference of heads of the **French Line** covering the proposed construction on three new motor liners for the company's European-Pacific service. According to reports, work on one of these motor-driven liners is now under way and that the vessel will be ready for service within eighteen months. These ships will be speedier than any of the present European-Pacific liners in service.

Friends of **Lawrence W. Welch** on the Pacific Coast will be interested to know that he has been placed in charge of the **Panama Pacific Line's** offices in Cleveland. Welch has been identified with the **Panama Pacific Line** since 1902 and is widely known in freight steamship circles.

Typifying the affection of the entire marine staff of the **White Star Line** for **Captain Ben Steel, R.D., R.N.R.**, who retired recently as marine superintendent of the company, a handsome marine clock was presented to him at Southampton. On the same occasion, Mrs. Steel was the recipient of a gold watch.

Following an operation, death claimed **John W. McLachan**, freight traffic manager of the **International Mercantile Marine Company** of Boston. Born in Liverpool in 1863, Mr. McLachan entered the steamship business at an early age. He served with the **Mississippi and Dominion Steamship Company** until



Left to right: Captain A. R. Cahling, Captain Joseph Dolan, both of the United States Steamboat Inspection Service, and Captain John Stephenson, master of the river steamer **Delta Queen**



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the company was taken over by the International Mercantile Marine Company. Shortly before his death Mr. McLachan was elected vice-president of the Railroad and Steamship Agents Association of Boston.

Declared to be one of the finest works of its kind ever seen, a miniature model villa is now being prominently displayed before passengers traveling aboard the I.M.M. liner *Majestic*. The miniature house is the work of **Alexander L. Davies**, second engineer aboard the *Majestic*. He has been engaged in the task for more than a year and the wood used in the building comprises virtually every known product of the forests of the world.

A committee of representative Los Angeles welcomed the arrival of the new Hamburg American Line's motorship *Los Angeles* when that vessel docked at berth 156, Wilmington. The committee welcomed **Captain H. Bradhering** and the other officers of the new vessel. Heading the welcoming committee were: H. H. Kinney, secretary to Mayor Cryer; W. G. Bonnell, chairman of the City Council; C. J. Colden, chairman of the harbor committee, Chamber of Commerce; R. L. McCourt, vice-president, Chamber of Commerce; C. C. Hine, chairman, transportation and harbor committee, Chamber of Commerce; H. R. Brashear, manager, transportation department, Chamber of Commerce; Charles Cooke, manager, tourist department, Chamber of Commerce; J. A. Kerr, chairman, foreign commerce committee, Chamber of Commerce; J. P. Kennedy, general freight agent, Los Angeles Steamship Company; E. A. Mills, Max Socha, and Sol Schiff.

Hutch I. Cone, of Florida and **Samuel S. Sandberg**, of California, succeeding W. S. Benson of Washington and Philip S. Teller of California as members of the United States Shipping Board, have both taken their respective oaths of office and are now busy promoting the interests of the American Merchant Marine at Washington.

Officers of the **Port of Portland Commission** recently elected are: **Frank W. Warren**, president; **K. D. Dawson**, vice-president; **H. A. Sargent**, secretary; and **Phil Metschan**, treasurer. The commission has voted to consolidate the traffic department under the head of **James**

Polhemus, general manager. It also fixed the salary of the traffic manager at \$10,000 annually. It formerly was \$15,000. **H. L. Hudson** occupies this post.

Promotion of Ferdinand E. Hueter, from chief clerk of the Matson Line's freight department to traveling passenger agent, has just been announced by the Matson Line. Hueter's territory will range from Santa Barbara on the south to the California State line on the north. Hueter knows the Hawaiian Islands thoroughly and is well equipped for his new duties. He has hundreds of friends up and down the coast as well as in Hawaii.

Steps have been taken by the **United States Employees' Compensation** commission to invoke action to safeguard workers engaged aboard tankers sent to shipyards for overhauling. The action, which has been favorably acted upon, stipulates that no tanker is to be sent to the shipyard until a cer-



Captain William R. Myer, popular master of the Matson *Australia* and South Seas liner *Ventura*.

tificate shows that the oil carrier is free of gas. There is now pending a resolution whereby West Coast shipyards will refuse to admit to drydock a ship that has not been certified.

Alfred G. Smith, president of the American Ship Building Company of Cleveland, who during the war supervised the building of 200 vessels in six Lake shipyards, passed away last month after an illness

of four months. Mr. Smith was the son of the late John H. Smith, a pioneer in the shipbuilding industry on the Great Lakes.

During the past six months more than \$13,000,000 was paid in tolls by vessels transiting the Panama Canal. For the same period of 1927 tolls collected from vessels traversing the Panama Canal aggregated \$12,324,849. During May of this year 508 vessels passed through the waterway, paying tolls of \$2,118,969.

James Tyson, president of the Nelson Steamship Company, announced the appointment effective the first of this month of **F. R. Weeks** as assistant general agent of the company with headquarters in Seattle. Mr. Weeks has just completed a survey of terminals of the company from Los Angeles to Puget Sound. Weeks is one of the best known steamship executives on the Pacific Coast and his promotion was well received in the shipping fraternity.

After spending several weeks in the East as representative of the company in the purchase of three freighters, the *Susherico*, *Sujejseyco*, and *Suholco*, from the Transmarine Corporation, **Millard R. Hickman**, superintendent engineer for the Matson Navigation Company, is back on duty at headquarters. The three ships which were inspected by Hickman are to be used in the San Francisco, Seattle, Hawaii service and are to be renamed *Manini*, *Makawao*, and *Makua*, respectively. The first to enter the service after miscellaneous repairs are effected will be the *Manini*. Her engine-room staff will comprise the following: **Jose Esmeraldo**, chief; **Samuel Bennett**, first assistant; **Alfred Casler**, second assistant; and **Edwin Lukens**, third assistant.

Recent engine room changes on Pacific Coast vessels are:

Thomas Smith, Jr., formerly first assistant on several McCormick freighter is chief engineer aboard the freighter *West Cape*, replacing **William Barker**, who is remaining shoreside for one trip.

Andrew Thomson has been appointed chief engineer of the Nelson intercoastal freighter *Sutherland*.

George Higgins, second engineer on the same vessel, has been appointed first assistant, and **Arthur**

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Beer and Curtis Kimball have joined the Sutherland as second and third engineers respectively.

Jack Holliday has returned to his duties as first assistant engineer of the steamer Santa Barbara after a long siege of illness.

Fred J. Lindsay, chief engineer of the Swayne and Hoyt freighter Point Lobos, has appointed **James Oliotti** as his first assistant.

As second assistant engineer of the Grace line steamer Cacique, **George Metzger** has taken up his new post below relieving **Earl Spencer**, who is remaining ashore for examination by the inspectors for an advanced grade of license. **Albert Heflin** joined the vessel as third assistant engineer.

A familiar figure in Pacific waters for many years, the Associated Oil Company's tank steamer William F. Herrin has left the west coast for delivery at New York to her new owners. **Emil P. Zerbe** took the vessel out as chief engineer and **Aaron Hershey** occupied the berth of first assistant.

Complete recovery from an acute attack of appendicitis is the good word for the friends of **William D. Schoning**, who was chief engineer of the Dollar round-the-world liner President Garfield. Schoning has been ashore for many weeks recuperating from the serious operation.

Bennie Martland is again fit as a fiddle, word from Riverside states. Martland, chief engineer of the Admiral liner Emma Alexander, was laid up for quite a spell suffering from serious illness.

To join the Montauk, freighter of the Dollar Line, **Herman LaBrance** and **James P. Farley** recently went to Seattle. They will take engineer officers' berths as second and third assistants. The Montauk will be placed in the Seattle-Orient service of the Dollar Line.

On his annual vacation, **Chief Engineer Mitchell Andrew** of the W. R. Grace freighter Cuzco recently put in an appearance in San Francisco. **Robert Brewer** acted as chief during his absence, while **Harry Arnold** acted in the capacity of first assistant engineer.

Death claimed **Captain Martin W. Beck**, veteran shipmaster, late last month. Captain Beck's pass-



Captain T. K. Oaks, who is relieving Captain Curt Zastrow as skipper of the Panama Mail liner Ecuador while the latter is on vacation.

ing occurred after an illness of only two days at his home in Oakland. For years Captain Beck was skipper on steam schooners and up until the time of his passing he was master of the Albion Lumber Company's steam schooner Albion.

Herbert J. Kehoe, head of the American - Hawaiian Steamship Company in New York and one of the best known maritime executives on the Atlantic Coast, passed away last month after a short illness. Pacific Coast friends of Mr. Kehoe were shocked to learn of his passing as he had recently paid a two months' visit to San Francisco.

That old-time Scotch engineer, "**Jamie**" C. Buchanan, well known on the Coast and who for several years has operated a machine shop and repair yard on Lake Union, Seattle, under the trade name of Westlake Engineering Works, has sent out removal notices to the effect that he has purchased property at the foot of McGraw Street and has erected thereon a well equipped shop and yard. Mr. Buchanan has a large number of friends among the operators of fishing craft and workboats who know his way of doing jobs and who will be pleased to be advised of that gentleman's increasing prosperity.

With increased facilities and more room, decidedly an advantage over the somewhat restricted area of his former establishment, Mr. Buchanan stands ready to take on any job in the marine engine or hull line and that such work will

be well done is without question. Pacific Marine Review wishes him well and bespeaks for the Westlake Engineering Works a continuance of good business.

The Oakland Traffic Club held its monthly meeting on Tuesday, June 19, which was the first anniversary of its existence, and the hundredth member was introduced.

The annual election was held and the new officers installed, after which Secretary T. T. Harrington showed a moving picture taken during the annual convention of the Associated Traffic Clubs of America held in San Francisco and Oakland on June 12 and 13. This reel was of exceptional interest and enjoyed by everyone.

The officers elected for the ensuing year are: L. A. Neill, president; J. H. Crowley, vice-president; T. T. Harrington, secretary and treasurer. Board of directors are: J. D. Yates, L. B. Hughes, G. P. Pell, F. A. Bell, M. B. Baker, G. D. Cron, and A. H. Glickman.

During the hectic years of wartime, W. D. Gardner was chief engineer for the Union Construction Company and many good vessels were built under his direction. Engine building, with lessening of ship work, caused Mr. Gardner to turn his attention to other lines of business. His training made him in a degree valuable as an adjuster of insurance matters where damage or loss of machinery is concerned, and he is now with the adjustment bureau of the Board of Underwriters, 325 Sansome Street, San Francisco. His many old time engineer and shipping friends are glad to see one of their clan filling a good shoreside job.

A combination water and air trip from New York to Paris was announced in June by **L. A. Archer**, Pacific Coast manager of the White Star Line. Connecting with the sailings of the steamers Majestic from New York on June 23 and the Olympic on June 29, ten-seater Farman-Goliath aeroplanes met the steamers at Cherbourg and carried passengers to Paris, at a slightly additional charge over their steamship fare.

"We hope this experiment with the Majestic and Olympic will be the forerunner of a regular service in the future," said Mr. Archer. The aeroplanes will cover the distance in about two hours, saving five hours on the train trip.

Pacific Marine Review

The National Magazine of Shipping

AUGUST, 1928

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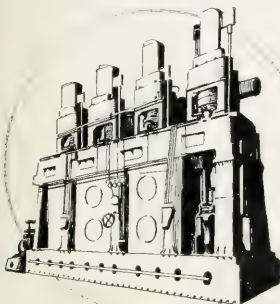
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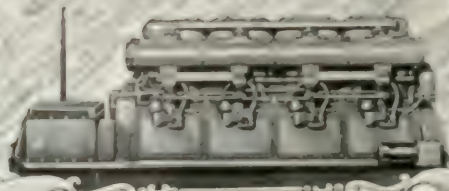


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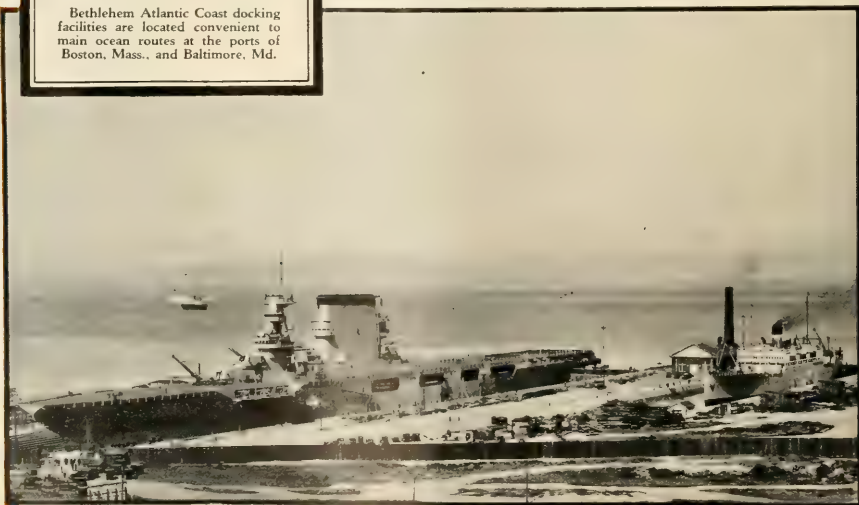
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U.S.S. Lexington, Airplane Carrier, in 1020-foot graving dock at Hunter's Point Works, Union Plant, San Francisco Harbor. At the extreme right, is shown U.S.A.T. Chateau Thierry undergoing repairs in the 750-foot graving dock.



Pacific Marine Review

The National Magazine of Shipping



Official Organ
Pacific American Steamship
Association

James S. Hines,
President and Publisher

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Member of Pacific Traffic Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

International Shipping Conference

THE fourth International Shipping Conference was assembled on June 12 at London. The meetings were held in the Drapers Hall under the presidency of Sir William Seager and lasted four days. Nineteen shipowning associations, representing fourteen countries, sent delegates; and delegates also were present representing the Baltic and International Maritime Conference and the Transit Section of the League of Nations. The countries represented were Australia, Belgium, Denmark, Finland, France, Germany, Great Britain, Holland, Italy, Japan, Norway, Spain, Sweden, and the United States. Some of the most notable ship operating executives in the world were on the list of official delegates.

The United States was represented by delegates from the American Steamship Owners' Association and from the United States Shipping Board. The former sent Ira A. Campbell (general counsel), George D. Ali (vice-president, Standard Transportation Company), James Kennedy (manager, Marine Department, Gulf Refining Company), and Edgar F. Luckenbach (president, Luckenbach Steamship Company).

Shipping Board representation included, Captain P. C. Grening (director for Europe), C. Skentelbery (general manager, operating department), W. J. Ferrick (radio expert), W. A. Spencer (general traffic manager), L. E. Anderson (legal representative), and F. Peacock (insurance division).

As indicated by the chairman in his opening address, the conference is a purely voluntary organization. Its object is to bring about internationally in maritime affairs "conditions that will be fair to all and inflict no hardship on any."

The first subject on the agenda was, "Trade Barriers." After considerable debate a resolution was adopted unanimously, the content of which was substantially as follows:

(1) Tariffs are too high and too many, lessening the buying power of consumers and the selling power of producers and hampering world trade.

(2) Customs protection should be lowered both for industry and agriculture to the lowest point indispensable to production.

Safety of Life at Sea was next considered. The resolution on this important topic included:

(1) Endorses the British suggestion for a diplomatic conference to revise the London Convention on Safety of Life at Sea.

(2) Urges upon such a Diplomatic Conference the reports and recommendations of the 1924 International Shipping Conference as a basis for their discussion.

(3) Urges national organizations to cooperate with their respective diplomatic representatives in supplying shipping and technical experts for the Diplomatic Conference.

Double Taxation of shipping was deplored in a resolution urging all governments who had not already done so to enter into bilateral agreements for the reciprocal exemption of shipping from double taxation.

Bills of Lading came in for the usual discussion and the action of the International Chamber of Commerce tending to a uniformly clean bill of lading was highly commended. Shipowners and their agents are urged to cooperate with this movement. It was resolved that negotiable railway consignment notes should not be applied to through water and rail traffic, and that the term bill of lading should not be applied to any document to which the shipowner was not a consenting party.

Helm Orders. A great deal of world-wide discussion has arisen over the resolution adopted to use the terms "left" and "right," or their ordinary national equivalents, in place of "port" and "starboard."

Wireless. There was considerable discussion over the differences in compulsory application of wireless to ships in the various countries represented. No substantial agreement was reached on this point, the matter being largely up to the governments concerned. If left to the shipping industry agreement could easily be reached.

On Limitation of Liability. The following resolution with explanatory note was unanimously adopted.

"This Conference urges all governments to ratify and put into force the Conventions on Limitation of Liability and Mortgages and Liens as they stand, with-

(Continued on Page 19, Blue Form)

Historical Development of Marine Structures in San Francisco Bay

I. The Pioneer Period Up to 1869

By R. M. Neily*

SAN FRANCISCO BAY, in common with most ocean harbors, has been subject to marine borer activity at least as long as records have been kept in this respect, although tradition says that the shipworm was not known there in Spanish days and did not become a menace until after the large shipping increase in the port which followed the gold rush of 1849.

In 1847, a year before the discovery of gold in California and three years before the state's admission to the Union, the municipality of San Francisco consisted of a settlement of some eight hundred persons, situated near what was known at the time as Yerba Buena Cove. This particular site had been selected many years before for the settlement, for the reason that the mainland elsewhere was very hilly, the shores rising abruptly from the water's edge, and the cove offered a protected ship harbor and possibility of future development. Few ships entered the port, no wharves existed, and landing places were of a small and temporary nature.

The possibility of filling the tideland of the cove had been suggested as a means of securing an additional area near sea level, and the sale of property so created was seen as a means of providing funds for the municipal treasury. To this end, the Governor was prevailed upon to cede to the municipality the government tideland rights. A paper survey was immediately made, streets were laid out and an ultimate shore line was established which would close out the cove. That same year the "water lots" were placed on sale and the public came into possession of what was soon to become the waterfront wharf area.

With the discovery of gold the port suddenly became the scene of great activity. By 1849 the migration to California was well under way. The transcontinental railroad was still a dream of the future; the gold fields lay westward of the great barrier of the mountains and the most available means of general transportation was by ship. These came from every port in the world. With the sudden demand for wharves, the public, already firmly entrenched on the waterfront, hurriedly built on the "water lots," while companies were organized to build wharves on the "water streets," which were leased from the city. The structures on the

former were of haphazard construction, while the latter were prepared with greater care and became the principal dock facilities. In this manner a great wharf area was created, upon which sprang up blocks of buildings where most of the city business was transacted. The first large wharf was that variously known as Commercial Street, Long or Central wharf, started in 1849. Within a year, twelve large wharves had been constructed, at an estimated cost of \$1,500,000, in addition to the innumerable small structures on the "water lots."

The wooden ships arriving in port were promptly deserted by their crews, who rushed away to the gold fields. These ships accumulated to such an extent that a chronicle of the time records that in 1849 "there were between three and four hundred square rigged vessels lying in the Bay, unable to leave on account of want of hands." A majority of these, and of those to follow in the next few years, never did leave port. Some of the abandoned hulks were purchased and permanently located to serve as wharves and buildings for general purposes. Three of them supplied the new city with standard municipal facilities: the Euphemia became a prison, the Panama a church, and the Apollo a saloon. In a short time the ships numbered "eight to nine hundred—like an immense forest stripped of its foliage."

With the great mass of unprotected timber in the harbor, all conditions were present to promote the propagation and spread of borer infestation. That marine borers were very active at the time is shown by the following quotation from an observer's record of the period: "When I landed again in San Francisco in 1857, I was astonished at the second great change which time and circumstances had wrought. . . . Some of the wharves had broken down; others were in a fair way to share the same fate, being veritable man-traps. . . . Many of the houses erected on the wharves were unoccupied and tottering on their insecure foundations of piles half demolished by the timber-worm." Thus many of the structures built subsequent to 1849 had become abandoned menaces by 1857; it is recorded that those which continued serviceable were only maintained by continuous renewal of piling.

While the borers present at the time have been variously referred to as timber-worms, shipworms, and teredo, it is likely that *Bankia* was the first form present. This borer is of the family *Teredinidae* along with the teredo, and although much larger, has the same general appearance and method of attack as the true teredo, which has led to confusion with the latter. There is no definite biological evidence, however, that the teredo was present until about 1913. If *Limnoria* had existed at the time it is likely that some of the many writers of that period would have observed and recorded the easily visible manner of its attack on piling, whereby the surface wood is eaten away near low tide level, reducing the pile diameter until it is cut through. Absence of comment by early writers on "teredo" attack, until the wharves began to collapse, is

*Reprinted from the report of the San Francisco Bay Marine Piling Committee.



Yerba Buena Cove, San Francisco, in 1848



Yerba Buena Cove, San Francisco, after the Gold Rush had begun in 1849

easily explained by the fact that the borers of this family work inside the pile, without visibly affecting the outer surface. The Board of State Harbor Commissioners reported in 1869: "The piles in this harbor are attacked by the shipworm known as the teredo navalis"—again with no mention made of *Limnoria*.

Evidence that this borer was observed shortly after 1869 is given by the statement of T. J. Arnold, Engineer of the Board, in 1873: "The *limnoria terebrans* has only recently made its appearance in our waters." It therefore appears that the three principal borers now present in the Bay became noticeably destructive at the following approximate dates: Bankia, 1850; *Limnoria*, 1870; and Teredo, 1913. That these were the dates of their arrival in the harbor cannot be established as more than conjecture. Some of the species appear to be indigenous.

Simultaneously with the beginning of wharf construction in 1849, work was started on grading off the sandy hills of the mainland, the excavated material being dumped into the Bay along the shore. In 1851 the State Legislature passed an act defining the city bulkhead line as that formed by certain proposed streets which approximated the desired limit. This caused a saw-toothed alignment in sections where it was necessary to follow around the rectangular street intersections to form a general curve. The act also

prescribed that wharves could only be built beyond the waterfront line on extensions of the city streets and for a distance not to exceed two hundred yards. This was the first definite ruling on harbor development to which early structures were required to conform. The ruling was faulty, however, since the streets were laid out only to the waterfront line; hence a wharf extension of any one of them could go in any direction beyond it. This resulted in many interpretations within the law and many irregular wharves. The filling of the cove area progressed so rapidly that by 1855 the wharves of 1850 were completely surrounded, and other such structures were finding it difficult to keep in advance of the fill far enough to provide adequate depth of water. This presented a new problem because of the lack of a retaining wall to hold back the fill. The huge quantities of material dumped into the bay were constantly being washed out by wave action, shoaling the wharves and causing disastrous settlement in those portions first placed. The latter effect was largely due to the fact that whole blocks of buildings had been hurriedly constructed on the new fill without adequate pile foundations.

This situation brought a general realization that such a condition could not continue and that a seawall must ultimately be built along the waterfront line. The project was actively discussed in the early 50's, but while it was generally acknowledged as necessary, no action was taken for many years because of the great expense involved. It was a foregone conclusion that the wall would eventually be built, cutting off all access by ship to wharves constructed within its line. It soon became apparent also, that the irregular wharves extending beyond the bulkhead line must ultimately be rearranged according to some definite plan. Thus it was demonstrated that the structures could not be built for permanency, even had materials and necessary funds been available. The condition is mentioned because it is typical of harbors in process of development, where no final plan has been determined and where wharves are likely to have a comparatively short economic life. This phase is discussed in detail under the subject of economic life of structures.



San Francisco business section and water front in 1900. Six years later, practically every building shown in this picture was destroyed by fire.

Meanwhile waterfront development of territories elsewhere around San Francisco Bay began in a limited way. Some small wharves were built at Oakland and a ferry service was inaugurated to San Francisco. No deep water wharves were constructed there until 1863.

In San Francisco the "Golden Era" of the first several years was followed by a period of financial depressions, starting in 1854, particularly in those branches of industry which had been overdeveloped in the first flush of prosperity; and one of the greatest problems presenting itself was the maintenance of the great number of wharves which had started to collapse because of decay and borer attack. From this time on, records relate the difficulties experienced with these structures, requiring renewal which amounted to complete replacement every four or five years. This condition, coming at the time of the financial depression, resulted in the abandonment of many wharves, already referred to. Due to this and other influences the general harbor conditions were soon in a chaotic state.

To remedy this situation and secure other benefits, the Board of State Harbor Commissioners was created in 1863 to control the San Francisco waterfront, and this body has continued in control to the present time. When they took up their duties about twenty-five large wharves existed, built for the most part on city streets.

It is recorded that on the day before their first meeting the Steuart Street wharf collapsed, dropping 150,000 feet of lumber into the Bay, and the Vallejo and Jackson Street wharves failed shortly afterward. Rehabilitation of the wharves to place them in operating condition was immediately undertaken as far as limited resources would permit, \$67,000 being spent in the first year and \$80,000 in the next.

In 1863 the San Francisco & Oakland Railroad Company completed a wharf at Oakland for its rail and ferry terminals "twelve hundred yards long, so that access was given to that town at regular hours, instead of being dependent on the tides as before." This was the start of Oakland Long Wharf, which was later to attract considerable attention because of the long life secured from creosoted piling used in its later construction.

The seawall for San Francisco was now considered urgently necessary, particularly because it would permit a permanent fill where piling was being maintained at great cost. In 1865 the Harbor Board took definite steps to accomplish the project; plans were formulated, and two years later the work began. The starting of the wall gave promise of a permanent waterfront development, but at the same time brought attention to the absolute inadequacy of unprotected timber piling for whatever new piers were projected.

American Bureau of Aircraft

A New Classification Service Begun as a Department of the American Bureau of Shipping in Cooperation With the Aeronautical International Register

STRIDES of aviation in the United States in the past few years have brought to the fore the necessity for additional facilities for aircraft insurance. Underwriters interested in entering this field have requested the American Bureau of Shipping to extend its existing operations to cover aeronautics as a neutral service to connect the operators with the insurance companies. In this respect, the Bureau, fully realizing that aeronautical engineering and operation is an entirely separate and different field from any of its present-day efforts, has organized, as directed at the last meeting of its board of managers, a new and separate department, the American Bureau of Aircraft, to be composed of experienced aeronautical personnel.

The American Bureau of Shipping is an established organization of sound financial standing, founded in 1862. It is incorporated under the laws of the State of New York with no stock and is not operated for profit to any individual or corporation. Its income is derived from classification and inspection and all accrued profits are, by its charter, devoted to the maintenance of the Bureau and the advancement of the art which it represents.

The American Bureau of Aircraft, the new aeronautical department, will receive its income from its aeronautical activities, and all such funds, after proper charges for expenses, will be used solely for advancing the purpose of this new art, at the discretion of its own committee. A general advisory committee is in the process of formation at the present time and will be composed of representative persons in the aeronautical industry.

Alexander Klemin, Professor of Aeronautics at New

York University, is retained by the American Bureau of Aircraft as consulting aeronautical engineer and his broad knowledge and experience in this field will be an invaluable asset.

This society is a signatory member of the Aeronautical International Register (A.I.R.) and represents therein the United States. The A.I.R. is composed of the following representative societies, in addition to the American Bureau:

The British Corporation Register of Shipping and Aircraft for Great Britain; Bureau Veritas for France; Imperial Japanese Marine Corporation for Japan; Registro Italiano for Italy; Norske Veritas for Norway; and Germanischer Lloyd for Germany.

There is a position between the airplane builder, owner or operator, and the underwriter which a Society of this nature can fill. Its function is to better coordinate the relations between them and to bring about a clearer knowledge of the condition of the aircraft involved, their operation, the country over which they fly, and general maintenance that will establish a better basis for the computation of the premium for the risk involved. In addition to a very complete initial survey, a system of monthly and tri-monthly inspections and check-ups has been devised. This service is designed to benefit the owner or operator not only as a safety factor but as an aid from the underwriting standpoint.

The various ramifications of the American Bureau of Aircraft in this field cannot be given at this time in detail but the above outline readily demonstrates the purposes with which it will enter this field.

Possible Jurisdiction over San Francisco Bay Bridges by the State Harbor Board

THE Board of State Harbor Commissioners, as such, has no jurisdiction over bridges across San Francisco Bay. But insofar as any contemplated bridge might have its approaches located on state property, over which the Board of State Harbor Commissioners has jurisdiction, there might undoubtedly be a conflict between the plans of the bridge builders and those of the Board of State Harbor Commissioners.

The right to build the bridge is secured either by permission of the War Department or by an Act of Congress. It has been held that the consent of the State to the construction of a bridge which has been already permitted by Act of Congress is unnecessary. (*Newark versus Central Railroad Co.*, 287 Fed. 196; *People versus Hudson River Connecting Railroad Corp.*, 228 N.Y. 204, 126 N.E. 801.)

The case of *Newark versus Central Railroad Co.*, supra, was taken to the Supreme Court; and while the District Court asserted that the consent of the state was unnecessary, the Supreme Court said that, inasmuch as the state and federal governments had both concurred, it was unnecessary to pass upon that point.

However, the promoters of the San Francisco Bay bridge, if the consent of Congress is secured, will undoubtedly also secure a franchise from the County on the left bank of the stream, as provided for in the Political Code. But this franchise, as well as the consent of Congress, is merely the grant of an abstract right. It is, in effect, merely permission to build a bridge provided the promoters of the project secure the necessary real estate for approaches, and the money with which to finance it. The franchise or the consent of Congress gives nothing more than this.

Of course, a bridge across San Francisco Bay would be a public enterprise and, as such, the corporation or municipality constructing it would have the power of eminent domain for the purpose of condemning property which might be used for such public purposes. Private property that would be necessary for approaches or other necessary uses could therefore be taken upon the payment of compensation by proceedings in eminent domain. However, the waterfront of San Francisco is not private property. The generally accepted doctrine is that lands owned by the state cannot be taken for public use under a general power to condemn land. There must be express statutory authority or the authority must arise from necessary implication, especially when the land is in actual use by the state for a public purpose, and the land is sought for another and inconsistent use.

Section 2524 of the Political Code, defining the jurisdiction of the Board of State Harbor Commissioners, recites that no person or company shall place or cause to be placed any obstruction in that portion of the Bay of San Francisco under the jurisdiction of the Board of State Harbor Commissioners, nor upon any wharf,

For several years the Supervisors of the City and County of San Francisco have been exerting much political pressure first on the United States Army Engineers and more recently on Congress to get permission to build a bridge and/or a tube from San Francisco to Oakland over the most crowded portion of the port. Since the City and County of San Francisco does not in this portion of its territory own or control the "left bank of the stream," we ventured to inquire "why all the big noise?" A prominent young legal authority of San Francisco, who has been studying this question, submitted the opinion thereon reproduced here.

pier, quay, landing, or thoroughfare, without the consent of the Board.

By Section 2542, the Political Code, all persons are prohibited from depositing or causing to be deposited in the waters of San Francisco Bay, under the jurisdiction of the Board of State Harbor Commissioners, any substance that will sink and

form an obstruction to navigation, without first obtaining permission in writing from the Board of State Harbor Commissioners. Of course, the foundations for piers for the support of the superstructure of any such bridge would form an obstruction to navigation. It is doubtful whether there is any statute which would give the power to condemn property on the waterfront of San Francisco under the jurisdiction of the Board of State Harbor Commissioners by implication. There is certainly no express statute which would permit the condemnation of any of this land for such a purpose.

This question, therefore, is one that should receive the consideration of those who are contemplating a bridge across San Francisco Bay, and the cooperation of the Board of State Harbor Commissioners is certainly an important factor of any such plan.

As an example of the purely permissive character of Congressional action on harbor bridges, we reproduce here the most recent instrument covering such action. This Act is very simple and might serve as a model.

An Act to Authorize the Port of New York Authority to construct, maintain, and operate a bridge across the Hudson River between the States of New York and New Jersey.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

That the consent of Congress is hereby granted to the Port of New York Authority to construct, maintain, and operate a bridge and approaches thereto across the Hudson River, at a point suitable to the interests of navigation, and connecting a point between One Hundred and Seventieth Street and One Hundred and Eighty-fifth Street, borough of Manhattan, New York City, with a point approximately opposite thereto in the borough of Fort Lee, Bergen County, New Jersey, in accordance with the provisions of an Act entitled "An Act to Regulate the Construction of Bridges over Navigable Waters," approved March 23, 1906.

Sec. 2. Construction of the said bridge shall be commenced within three years and it shall be completed within seven years from the date of the passage of this Act, and in default thereof the authority hereby granted shall cease and be null and void.

Sec. 3. The right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1925.

Maintenance of Marine Terminal Facilities of Timber and Concrete Construction

By Frank G. White, Chief Engineer,*
Board of State Harbor Commissioners, San Francisco

THE problem of the maintenance of maritime terminal facilities is one which, like the poor of Biblical note, we have always with us. As is the case universally, neglected maintenance eventually means increased expense and this is especially true in connection with structures exposed to sea water action or to waterfront atmospheric conditions. Many of the materials of construction in common use deteriorate more rapidly when incorporated in marine structures than is the case in inland locations. Also, from the very nature of the facilities and of the service which they are called upon to perform, some portions of the structures are subjected to extremely severe treatment, the natural result being accelerated deterioration. The problem of meeting and combating these conditions is one which continually confronts us and demands solution.

Timber Structures

In most of the ports of the United States and Canada timber structures very largely predominate. This is only natural when we consider our large timber supplies and the adaptability of timber to the construction of marine structures. While the result is economy in original cost, nevertheless the use of timber results in a difficult maintenance problem with its attendant expense.

Piling

It was demonstrated long ago that the use of unprotected timber piling was uneconomical and actually unsafe in sea water except in the most temporary of structures. After much experimentation and research the almost universal practice now is to use creosoted timber piles in waters which are infested by marine borers. But both the teredo and the limnoria in the early stages of their development are extremely small and if the creosoted shell is punctured they are ready to enter and devote their energies to the destruction of the untreated heart of the pile. In spite of the most rigid rules and careful supervision it is impossible to entirely prevent damage to piles in the water section.

During the years from 1912 to 1915 inclusive the Board of State Harbor Commissioners constructed a considerable number of creosoted pile piers at San Francisco. By 1920 it became evident that, due to abrasions in the protective creosoted shell, caused undoubtedly by improper and careless handling during construction, limnoria were attacking the piles between high and low tide lines. It was decided to attempt to prevent further deterioration from this cause by cleaning out the holes which had been eaten in the piles and closing them so as to prevent the entrance of borers. The holes were filled with rich cement mortar and covered with a patch of plaster of Paris to prevent the washing out of the cement before it had an opportunity to set. More than 4200 such plugs were applied in 1921 on structures in which the total number of piles was nearly 20,000. The repairs were very effective and almost no piles in these structures have been replaced. Undoubtedly abrasions similar to those which were repaired exist below low tide and are being attacked to

some extent by limnoria and teredo; however, no repairs below this level have been attempted and few replacements have been required.

In cases where it is necessary to replace a considerable number of creosoted piles located under the transit sheds, our method of operation is as follows: A small pile driver is rigged with the leads of such height that it can operate under the shed trusses. At the point where a pile is to be placed a hole is cut in the roof and another in a deck alongside the cap. The pile is dropped through the holes by means of a floating derrick or a long boom rigged on a floating driver. By means of a block and tackle the pile driver engine pulls the pile down until it will go under the hammer, after which it is driven, cut off, pulled under the cap and secured in the usual manner. If a limited number of piles are to be driven, in order to avoid rigging a low driver inside the shed, it is customary to use swinging leads which are lowered through the roof over the pile, the hammer being operated by means of a runner leading over a sheave on the end of the boom and down to the engine on the floating driver.

Timber

The rapid decay of timber which is alternately wet and dry or which is moist without being saturated is proverbial. It is our experience that the caps, stringers and planking in those portions of the decks of piers under the transit sheds have an extremely long life. On the contrary the same timbers when used in the construction of the aprons outside the sheds, where they are exposed to the weather, have a much shorter life. Particularly is this true in the case of timbers which are in contact or so located that moisture is retained and free circulation of air is not permitted. For example, the contact surfaces of caps and stringers, the upper edges of stringers, the abutting surfaces of compound stringers and the upper and lower surfaces of railroad ties in the flush tracks retain moisture and are points of attack which are subject to comparatively rapid decay. This is also true of the sills of timber transit sheds. Many of the older piers on the San Francisco waterfront were constructed with the sills resting on top of the deck planking which extended outside the sheds. With no adequate means of drainage provided, moisture entered and was retained between sills and planking and between planking and wall stringers. In order to replace the defective members it is now necessary to jack up and support the columns and walls and to cut off the planking inside the walls. The columns and studding are then supported directly on new stringers and short planks are used outside the sheds, slots being provided for drainage along the outside of the walls.

In all new structures the timber outside the transit sheds is treated with six pounds of creosote by the empty cell process or with twelve pounds of creosote if it extends below the line of high tide. In the case of replacements in old structures where the expense of creosoting is not considered justifiable, all contact surfaces are painted with a heavy preservative paint containing vegetable gums and creosote oil. This has proved very effective as it excludes moisture and, on

*CONTRIBUTOR: Association of Ports, and Free Port, Los Angeles, June 27, 1922; San Diego, June 1922.

account of its toxic properties, materially retards decay. Primarily to provide a good trucking surface and to prevent wear in the deck planking but incidentally to assist in excluding moisture and as a fire protection, it is our practice to cover the decks of our structures with a bituminous pavement. If proper drainage is provided this is of material benefit in retarding decay, particularly outside the transit sheds.

Timber Transit Sheds

The maintenance of the outside walls of timber transit sheds has involved considerable labor and expense during recent years. These walls were constructed of ordinary one-inch redwood channel rustic nailed directly to the studding and are now from 15 to 25 years old. In order to make them water-tight in the case of a driving rain it has been found necessary to cover the old siding with a layer of building paper and a second course of redwood rustic. This necessitates the rebuilding of many of the sliding doors and the replacement of the door hangars and track as well as considerable fitting around the windows; and while the expense is considerable it permits of keeping in service buildings which are otherwise serviceable.

In connection with the painting of the outside walls of timber transit sheds, it has been found that the location materially affects the problem. Along some portions of the waterfront adjacent to large sewer outfalls or in close proximity to "Butchertown," ordinary white lead and oil paint cannot be used as it turns black in a very short time. It has been found that it is necessary to use a nonbilinging paint containing no lead.

Ferry Slips

With fifteen passenger and automobile ferry slips and five railroad ferry slips located on State property, the Harbor Commission has a problem in maintenance which is not common to most Pacific Coast ports. Two slips were built by one of the ferry companies and, in addition to these, four others are maintained by the tenants; but the maintenance of the rest is handled by the repair organization of the Harbor Commission. Even under normal operating conditions, with ferry boats arriving and departing every fifteen or twenty minutes, the mortality is high, as is also the cost of repairs.

The slips as usually constructed have two or three rows of spring fender piles, the rows being separated and tied together by three lines of longitudinal laminated ribbing, each line being built up of three 4-inch planks. Heavy pile clusters are provided at the inner and outer ends; diagonal sheathing is provided to take the wear; and the spring lines are backed up by rigid structures which permit of a movement of the fender piles of from two to three feet. Obviously the sheathing, which is subject to continual chafing, requires frequent replacement. The creosoted piles even in ordinary service are sometimes cracked below the water line, permitting the entrance of marine borers. The greatest decay is in the laminated ribbing; and in all new work or reconstruction it is the practice to paint contact surfaces with preservative paint.

Fender Systems

The problem of the fender systems along the sides of the piers and wharves is akin to that of the ferry slips, although the service is materially different, the weight of the vessels being much greater but the frequency of arrival and departure and the speed being lower. Types of fender systems have been changed frequently in an endeavor to devise one which would

have a lower cost of maintenance. Originally it was customary to use untreated piles secured to the structures at the deck line. They are subject to heavy attack by marine borers, although it has been found that the life of eucalyptus is much longer than that of untreated Douglas fir. On some of the concrete structures short vertical fender timbers have been supported by means of concrete cantilever brackets and backed up with triple coil springs. Timber structures have been provided with creosoted fender piles outside of which are short vertical timbers or pile butts to take the wear. In recent structures these short timbers have been used without driven piles, the lower ends being braced back to the structure. It is believed that the last has shown the lowest maintenance cost, although at best the fender system, on account of the very nature of its service, is the most expensive portion of the structure to maintain.

Concrete Structures

The construction and maintenance of marine structures of concrete and reinforced concrete have been the subject of a great deal of discussion among port authorities everywhere. The goal which is sought is a type of construction in which the initial cost is not too high and in which the annual maintenance cost is reduced. The engineers of the Board of State Harbor Commissioners have done their full share in attempting to discover the best method of using reinforced concrete as a substitute for timber in piers and wharves. More than one absolute cure-all has been devised and the final solution of the problem has been arrived at more than once; but in most instances the supposedly perfect design has proved faulty at some vital point.

Piles and Cylinders

One of the types of construction introduced thirty or more years ago consisted of a timber pile enclosed by a form made of iron plates, the space between being filled with concrete. There are in San Francisco two old piers which were constructed in this manner and there has been practically no maintenance required as far as supports are concerned. This is undoubtedly due to the superior quality of the iron shells as there has been some deterioration of the concrete due probably to inferior materials and workmanship.

The next step was the substitution of wood stave forms for the iron forms, dependence being placed upon the reinforced concrete pile covering. This confidence was misplaced due to the difficulty of securing good work where all of the governing conditions were adverse. Eight piers were constructed from 1903 to 1906 in which this design was used, but by 1920 the majority of the jacketed piles had been replaced by creosoted piles. In contrast to this experience and as an indication of what can be accomplished by careful supervision and workmanship, one pier constructed in 1910 and supported on 770 cast-in-place concrete jacketed piles is in excellent condition. In 1922, seventeen jackets were repaired where they were defective by covering a section with a sleeve of reinforced concrete.

As a substitute for the cast-in-place pile protection described above, several wharves and one pier were constructed from 1907 to 1911 in which precast reinforced concrete jackets were used. They have been highly satisfactory and after 17 to 21 years service none has been repaired or replaced and the existing defects are small in number and minor in character.

As a logical step in the evolution of the perfect supporting member, the next move was to eliminate the timber pile and to construct solid cylinders of rein-

forced concrete resting on enlarged bases or pile clusters depending upon the nature of the bottom. As the cylinders were from three to four feet in diameter it was expected that thorough spading and tamping could be secured. It was found, however, that numerous defects developed, principally at construction joints which, in many cases, were located between tide lines. Where these were of such extent as to expose the reinforcing steel they were repaired by encasing a section of the cylinder in a collar of dense concrete. This was comparatively simple where the defects occurred above low tide. For making repairs below low tide a sectional sliding form was devised within which the concrete was deposited and lowered to the required depth, being entirely enclosed so as to prevent the washing out of the cement. From 1909 to 1913, eleven piers were constructed on solid reinforced concrete cylinders. On six no repairs have been required and out of a total of 4911 cylinders 514 have had no defects enclosed in concrete collars. While the repairs have been rather expensive they have proved effective.

Precast reinforced concrete piles were first used by the Board of State Harbor Commissioners in 1911, and approximately 12,000 are now in service. Although more than 11,000 of these are from eight to seventeen years old, no replacements or repairs have been required and the defects which have developed are only minor in character. They consist of short cracks over the longitudinal bars above the water line with slight corrosion of the steel but no spalling of the concrete.

On account of very obvious advantages as regards first cost and maintenance the use of precast reinforced concrete piles and jacketed timber piles has become standard practice with the State Harbor Commission. The choice of type depends upon the foundation conditions, each having distinct advantages in certain locations.

Deck Beams and Slabs

As has been the case with the supporting members of the piers and wharves, the design of the deck beams, girders, and slabs has been revised and modified in an attempt to make them more durable and to reduce the expense of maintenance. The first pier in San Francisco having a deck of reinforced concrete was constructed in 1910. It was of the ordinary girder, beam and slab design commonly used in the floors of reinforced concrete buildings. Following this numerous additional piers and wharves of the same type were constructed and in general they have proved satisfactory. Within the last few years, however, some corrosion of reinforced steel accompanied by cracking and in a few cases spalling of concrete has occurred in the beams and girders in the older structures. In order to reduce the number of points subject to this sort of attack, the first modification was to eliminate the small beams, simplify the design of the girders, and increase the span and thickness of the slab. In more recent structures the beams have been eliminated, a flat slab design being used for the deck. More care has been exercised in holding the steel in exact position and securing the necessary embedment. In addition the under side of the decks including the heads of piles and pile jackets have been covered with a heavy coat of asphalt which it is believed will prevent absorption of water by the concrete and also evaporation and thus retard corrosion of the reinforcing steel.

The only repairs to deteriorated deck beams and girders which have been undertaken are now under way on the pier already referred to as having been

constructed in 1910. A critical examination indicates that in many places the steel was too close to the surface and that the concrete was poured too wet. In the case of beams and girders which show cracking, the defective concrete is removed with air hammers, the corroded steel is sandblasted, galvanized fabric is wired in place, and the members are covered with a heavy coat of gunitite. After the repairs are completed the entire under side of the deck is to be covered with a heavy coat of asphalt. The work has progressed far enough, it is believed, to indicate that it will be effective, and while the unit cost is considerable the total is not excessive when the age and size of the structure are taken into account. It is the intention to make similar repairs to portions of other structures where there are indications of similar deterioration so as to check and retard the action and when necessary the cracked heads of piles will be treated in the same manner.

No mention has been made of the repair of damages, which may consist of anything from the replacement of a piece of siding broken by a sling load of cargo to the reconstruction of the entire outer end of a pier wrecked by a steamer in a fog. Whenever possible the cost of making such repairs is collected from the company responsible for the damage and in this we are generally successful. Practically all maintenance and repair work is carried out by our own organization and we are definitely of the opinion that this system is more satisfactory and economical than to attempt to have such work done by contract.

Effect of Design Upon Maintenance

It is obvious to anyone connected with the maintenance of port facilities that the necessity and cost of such maintenance are vitally affected by details of design as well as by quality of workmanship. In timber structures the points to be most carefully considered are the exclusion of moisture, provision for perfect drainage and free circulation of air, and the handling without injury of creosoted materials. In reinforced concrete structures it is important to simplify the design so as to eliminate points where there is probability of corrosion beginning, to embed the steel to a sufficient depth, to use as dense and impermeable concrete as possible and to water-proof the vulnerable parts of the structure so as to retard absorption and evaporation. Careful consideration of these and other important details will very definitely lead to a reduction in the cost of maintenance.





Modern Facilities for Building Modern Liners

The Union Plant of the Bethlehem Shipbuilding Corporation, a Consistent Producer of Good Naval and Mercantile Vessels

THE "Union Plant of the Bethlehem Ship" is the largest aggregation of shipbuilding facilities on the Pacific Ocean and one of the most important in the United States.

Starting its shipbuilding activities on San Francisco Bay in 1906 with the Union Iron Works, San Francisco, as its Potrero Works was formerly called, the Bethlehem Shipbuilding Corporation in 1908 acquired the Hunter's Point Works; in 1916 constructed the Alameda Works; and in 1923 acquired the San Pedro Works. It has capacity, if business offers, to build simultaneously fifteen freighters or combination freight and passenger liners, and is equipped with four floating docks, ranging in lifting capacity from 3000 to 15,000 tons, with two marine railways of 2000 and 4000 tons lifting capacity, and with two graving docks the largest of which is among the largest in the world and could easily take the largest ship afloat today. The two marine railways are at the Alameda plant and all wooden ship repair is done at that yard. This plant as a whole covers, under one management, shipbuilding and repair facilities separated by some four hundred miles of coast and covering the two principal harbors of California.

In this article, however, we will confine ourselves to the Potrero Works and the Hunter's Point Works of the Union Plant as a unit having all the facilities necessary

to undertake the construction and assembly of the many complicated features that enter into that self-propelled floating hotel and warehouse—the modern combination freight and passenger liner.

The Potrero Works covers about 35 acres and has 1785 feet of waterfront. This site is covered with a compactly arranged group of buildings, plate storage yards, and shipbuilding slips that are served by a well laid out system of cranes and

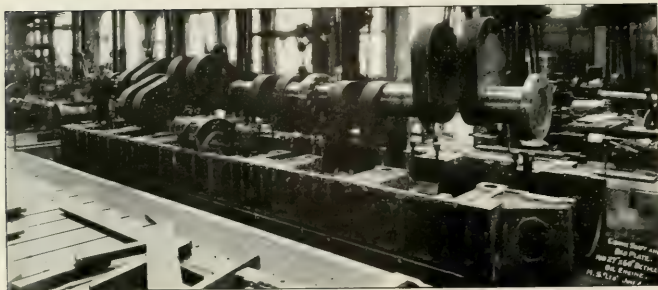
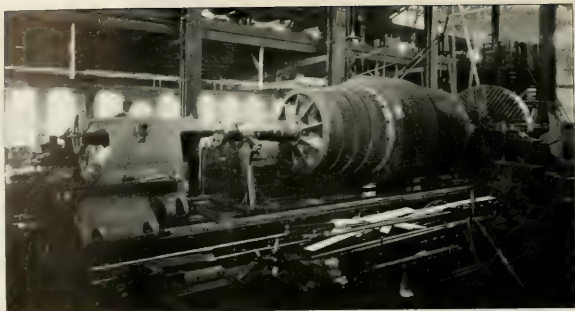
industrial railways. The site is practically in the heart of San Francisco, with deep water frontage on the bay.

On one side of a main roadway through the plant are located the pattern shop, foundries, machine shop, and erecting shop; and on the other side the shipyard with the boiler shop, blacksmith shop, copper shop, pipe shop, joiner shop, paint shop, mold loft, plate shop, bending slabs, and furnaces, riggers loft,



The intercoastal liner California in Hunter's Point Dock, San Francisco.

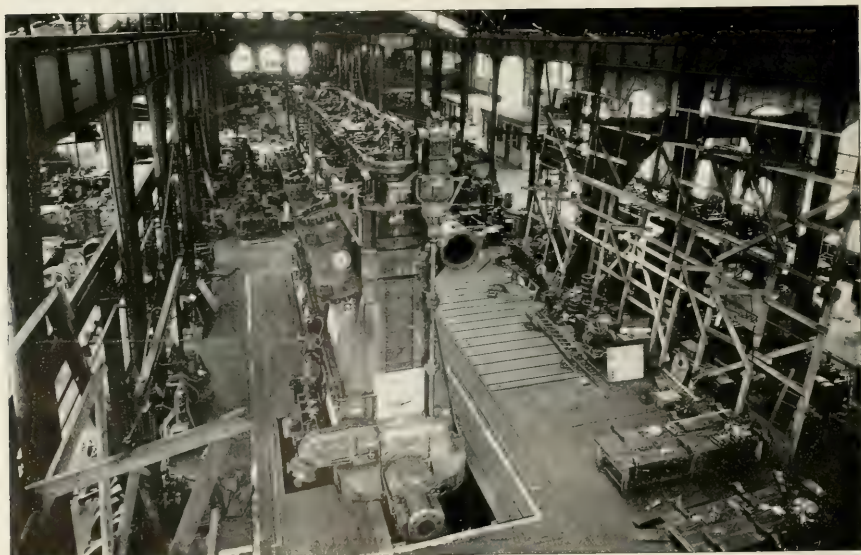
THE MACHINE SHOP
AT
THE POTRERO WORKS
BIRTHPLACE OF MANY
OF THE FINEST MARINE
ENGINES BUILT IN
AMERICA



Above, the low pressure turbine rotor of the H. F. Alexander in the 141-inch lathe at the Bethlehem Plant of Bethlehem. This rotor weighs 63,000 pounds.

At left, the bed plate and built-up crank shaft of the Bethlehem diesel engine for the tanker Lio.

Below, the main bay of the machine-erecting shop with the Lio's engine on the floor.



shipbuilding slips, floating docks, and outfitting wharf. On the shipyard side, too, are located the general offices, drafting rooms, and power house. Transcontinental railroad connection is tracked into the center of the shipyard.

The Potrero Works has always, since its first establishment on this site, undertaken general engineering service as well as shipbuilding. Much of the great mining machinery for which California is famous was first developed in this plant. The policy of the management from the beginning has been, "preparedness to make everything necessary for the complete ship." It will therefore be apparent that when we speak of pattern, foundry, machine, and erecting shops in connection with the Potrero Works of Bethlehem, we do not have in mind the ordinary facilities coming under these heads with the modern specialized shipyard. These facilities at the Potrero Works are equipped to build and have built mining machinery of every type up to the largest capacity; municipal steam pumping plants; dredging apparatus; marine power plant for steam reciprocating, steam turbine, or diesel drive to the highest specifications for either mercantile or naval service; marine auxiliary power plants and all types of marine auxiliary machinery; street railway power plants; and astronomical observatories. In short, these shops are prepared to undertake any engineering construction.

In the palmy days of the reciprocating steam engine, this shop turned out the finest engines of that type ever built for the United



The sheer legs at the outfitting wharf lifting out the low pressure rotor of the H. F. Alexander's turbines.

States Navy. The steam plant of the U. S. battleship Oregon, the U. S. cruiser Olympia, the U. S. torpedo boat Farragut, and the cruisers Milwaukee, South Dakota, and California as examples of triple and quadruple expansion vertical reciprocating engines ought to be sufficient evidence of the high standard of excellence in workmanship and material which has always characterized Union Plant products.

Just before the European War, this plant delivered to the Matson

Navigation Company the combination freight and passenger steamer Maui. This vessel is driven by Westinghouse geared turbines. After hard transport service during the war and nine years steady grind on her regular San Francisco-Honolulu run, the Maui was laid up last winter for reconditioning of her passenger quarters and a thorough overhaul. So carefully had her turbines and machinery been installed that, with the exception of reboring turbine bearings to restore blade clearance and the rebalancing of rotors, her machinery was apparently as good as new.

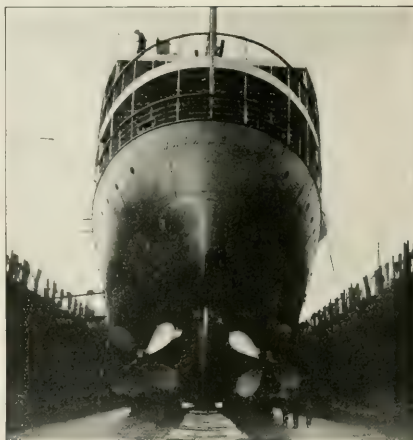
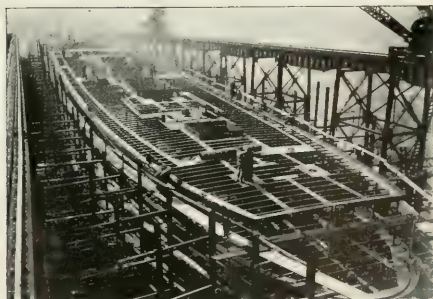
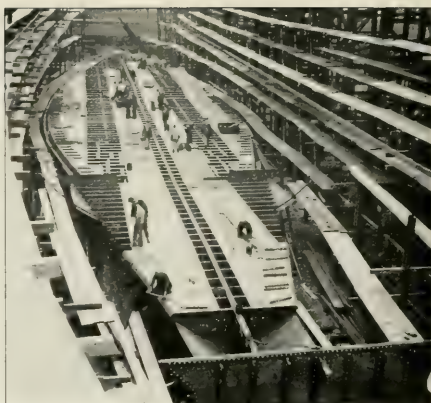
During the war the machine shop of the Potrero Works built many turbines for United States destroyers constructed at this plant and also for those built at the Risdon Destroyer Plant located adjacent to the Potrero Works and operated for the United States Navy Department by the Bethlehem Shipbuilding Corporation.

The most recent example of excellent workmanship in marine power plant credited to the shops of the Potrero Works is the large Bethlehem diesel engine built for the tanker Lio of the General Petroleum Corporation. This engine, of 3000 brake horsepower in six cylinders, is, so far as we know, the largest ever built on the Pacific Coast. Experience in diesel engine construction at the Potrero Works prior to this engine was limited to auxiliary engines of a different type and up to about 300 horsepower. The big engine was built, lined up, and erected on the shop floor, and without any power test runs was dismantled for erection



The combination freight and passenger liner Maui of the Matson Navigation Company's San Francisco-Honolulu service. This fine turbine steamer was delivered by Bethlehem just before the war and has been making her schedule with perfect regularity ever since.

Some Construction Views of
the Most Recent Product
of the Union Plant of the
Bethlehem Shipbuilding
Corporation, Ltd. The
Inter-Island Steam
Navigation Co.'s
Passenger Liner
Waialeale



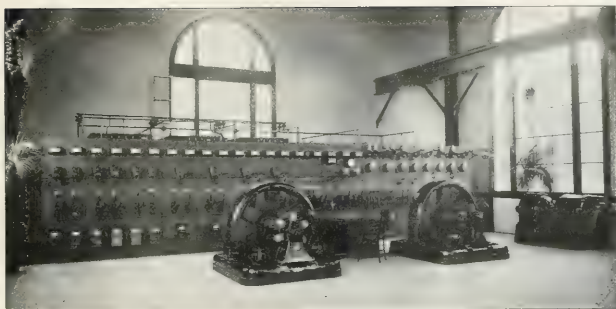
Upper view, the tank top of the Waialeale.

Left center, looking down on the boat deck with framing practically complete.

Right center, the beautifully molded cruiser stern, and,

Lower, the Waialeale at the outfitting dock.

The switchboard in the power house of the Potrero Works, Union Plant, gives the operator complete control of all the electric power circuits in the various shops.



in the ship following the usual marine steam engine practice. The tanker *Lio* converted by the installation of this engine from steam turbine to diesel drive was delivered to her owners late in 1925 and has been running with perfect regularity ever since. The satisfactory behavior of this engine and the way in which it was produced by this shop shows very conclusively that the high standards of workmanship and the resourcefulness of personnel are as much in evidence today as they have always been during the history of the Union Plant. The *Lio* has run more than 200,000 miles since being placed in commission, has made several trips round the world and on one occasion was loaded and out to sea again in 27 hours from the time of her arrival at her home port.

Turning to the shipyard side, we come first to the general offices where, were it not for the conservative attitude of the general management, we might pause long enough to mention a few of the reasons why the executive staff of the Union Plant is peculiarly qualified to build first-class modern ocean lin-

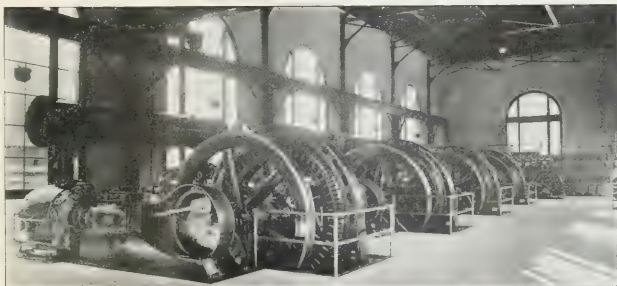
ers. We will at least make this sweeping observation—every one of the men now in active charge at the Union Plant has come up to his present position by right of merit gained through practical experience in the plant itself. They are all thoroughly imbued with that "pride in product" which is the keynote for setting a high standard in all of the output of the plant. There are few groups of shipbuilding executives who have had such varied shipbuilding and marine engineering experience as these men, and there is no group with a more earnest desire to give the best possible quality within the economic limits of each job developed under their supervision. Many special types of vessels peculiarly suitable for Pacific Coast and Pacific Ocean service have been developed in the Union Plant drawing rooms or with the collaboration of Union Plant naval architects and engineers.

The physical shipbuilding plant under this organization is equipped now with three shipbuilding slips, each capable of taking a vessel 500 feet long. These slips are served by elevated traveling and revolving

electric boom cranes running on tracks supported on steel trestles. Two slips each capable of taking a vessel 650 feet long have been dismantled, but can be rehabilitated easily on short notice and lengthened if necessary to suit a 1000-foot liner. Across the heads of the three slips are the plate shop and fabricating yard, bending slabs and furnaces. These are equipped with tools capable of handling the heaviest ship plates and frames. Above the plate shop is the mold loft, shive board, and templet storage. Grouped conveniently nearby are the joiner shop, coppersmith shop, pipe shop, riggers loft, and boiler shops. Adjacent to the building slips is the outfitting wharf equipped with electric sheer legs of 100 tons lifting capacity. Beyond the outfitting dock are three floating drydocks with capacities from 2500 to 6500 tons.

The boiler shop of this plant is worthy of special mention in that it is equipped to manufacture either the largest commercial boilers of the Scotch type or water-tube boilers of the United States Navy type. Some of the special tools developed

View in the power house at the Potrero Works, Union Plant, showing the four large electrically operated air compressors which furnish power for the pneumatic tools used in so many operations in modern shipbuilding.





The waterfront of the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco.

at the plant for this latter type of boiler are not surpassed in accuracy or efficiency by those in any boiler shop.

Taken in conjunction with its Hunter's Point Works, the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., stands in a unique posi-

tion among American shipyards as operating under one management the only shipyard in the United States that can, on its own property build, equip, outfit, and drydock a modern first-class liner of 700 feet length.

The large graving dock at Hunter's Point is 1020 feet long, 120 feet wide, and has 40 feet of water

over the sill at high tide. It is the only dry-dock in the United States operated by a private shipbuilding corporation that will take vessels of the largest size afloat. When the United States entered the World War this dock was the only dock in America that could have taken the Leviathan.

Union Oil Expansion

AT A RECENT meeting of the directors of the Union Oil Company, the necessity of additional officials to care for the company's rapidly expanding business resulted in the election of two vice-presidents, R. D. Matthews and Paul N. Boggs, making the total number of vice-presidents five. E. W. Clark, executive vice-president, W. W. Orcutt, and L. P. St. Clair complete the official family under the leadership of W. L. Stewart, as president, with R. J. Keown, treasurer, and John McPeak, secretary.

The election of Messrs. Matthews and Boggs as vice-presidents rounds out a new administration plan which Mr. Stewart deemed advisable in order to handle the rapidly increasing responsibilities due to the company's phenomenal growth within the United States and its rapid expansion abroad. The new plan of administration involves the dividing of the operations into three divisions:

Production operations, including geological, lands and leasing, drilling and production, pipe lines and storage, crude oil purchases and production publicity, under the direct responsibility of Vice-President L. P. St. Clair.

Manufacturing operations, including refining and storage, research, gas operations, and pur-

chases of refined and semi-refined products, under the direct responsibility and authority of Vice-President R. D. Matthews.

Manufacturing operations, including refining and storage, research, gas operations, and purchases of refined and semi-refined products, under the direct responsibility and authority of Vice-President R. D. Matthews.

Distribution operations, covering all sales activities, sales organization, facilities and storage, marine and railroad transportation, advertising and sales publicity, under the direct responsibility and authority of Vice-President Paul N. Boggs.

Both of the new vice-presidents have been affiliated with the petroleum and allied industries for many years. Mr. Matthews joined the Union in 1914 as comptroller, being elected shortly thereafter to the executive committee and the board of directors. During recent years his duties have been extended into the manufacturing operations as well as the financial end of the company's business.

Mr. Boggs came to the Union Oil Company, in 1924, from the Union Tool Company, then a Union Oil subsidiary. His identification with the oil industry dates back to 1902, when he became affiliated with the W. T. McFie Supply Company. Later

he served as vice-president and general manager of the J. F. Lucey Company, manager of the Fulton and Adeline Consolidated Road Oil Company and then as president of the Union Tool and vice-president and general manager of the National Supply Company.

At the present time the company has a daily production of 40,000 barrels with about 16,000 barrels per day shut in. It has 635 producing wells. Field holdings total 1,106,246 acres distributed over California, Colorado, Wyoming, Mexico, Venezuela, and Colombia. Six refineries are operated in California. In addition, seven absorption plants are maintained. The normal daily crude and cracking capacity of the refineries is over 100,000 barrels and of the natural gasoline absorption plants 115,000,000 cubic feet of gas.

The sales territory of the Union includes California, Oregon, Washington, Arizona, Nevada, Hawaii, British Columbia, Alberta, Mexico, the Orient, and South America. Recently, through a subsidiary corporation, Union products have been and are marketed in Australia. Three hundred and fifty foreign and domestic sales stations and four hundred and fifteen owned service stations are operated. Sales for last year totalled \$81,000,000.

The Foreign Trade Outlook

By Eugene P. Thomas, President, United States Steel Products Company*

THE international commerce, during 1927, of the 72 principal nations of the world, exceeded sixty billion dollars in value, with a gain in volume, over 1913, of about 5 per cent. The increase over 1926 was substantially the same. In that year the volume of the world's international trade returned to what it had been prior to the war.

Europe, although she has made a distinct advance, has moved ahead at a slower pace than the other five groups and divisions of the world. Our own gain in volume of exports was 10 per cent. This was gratifying, as our exports for 1926 were, in many lines, abnormally large because of the British coal strike. Notwithstanding recession in those lines which were thus stimulated in 1926, the total volume of our exports of other commodities increased substantially more than 10 per cent.

The outstanding feature of the foreign trade of the United States, and also of the world, in 1927, was the price decline, which kept our increase in total value down to almost 1 per cent, and in the case of some other countries, the values were less than in 1926, although the volume increased. The average price reduction was approximately 10 per cent in the foreign trade of the 72 principal nations.

That, notwithstanding these receding prices, the total value of our exports of finished manufactures should have advanced, means, of course, a still larger gain in volume. In 1927 we reached a new peak in the export of finished manufactures. They were 42 per cent of our total exports, as against 38 per cent in 1925, and 34 per cent in 1922. That, in such a fierce contest for supremacy, we have been able to more than hold our own, is justification for a certain degree of satisfaction.

To American foreign traders, these figures are significant. They indicate that with our export expansion more rapid than that of our foreign competitors, the 5 per cent increase in world consumption is insufficient to satisfy their urgent need for export business in excess of the annual increase in world de-

mand, and that values have suffered in the scramble for business.

World Consumption Less Than Supply

As we increase our exports of commodities which come into direct competition with European manufacturers, we must expect, as a natural corollary, such recessions in prices so long as supply exceeds demand. While we are entrenching upon what the European manufacturer regards as his rightful share, the generous emission of foreign

the retirement of certain manufacturers from the export market, in order that Europe might benefit to a much greater degree than their expanding business has already shown, have been confronted with the following facts:

In the first place, the lowest costs of production are only possible if our works are operated at a high percentage of capacity. Plants which are wholly or partly closed down constitute a heavy charge upon production, and increase costs. Experience has shown that export orders have frequently enabled continuous operation of enterprises which would have been compelled to close for an extended period had they been dependent alone on domestic orders. Continuous operation of these works reduced the average cost of their products, and this was undoubtedly reflected in the prices at which they were sold—not only to the foreign purchasers, but also to the domestic trade—likewise in reduction of unemployment and in maintenance of high wages.

The resolution passed by the directors of the National Association of Credit Men, on February 20, 1928, is also of interest.

In order to maintain our present scale of prosperity, American exports must be increased. In the resulting added contacts in world markets with debtors in countries beyond the borders of the United States, our credit and financial executives must play an increasingly important part if these relations are to be kept within the bounds of sound business and still develop to their full possibilities.

The day is fast passing when export markets can be considered only as a field for cash or secured transactions. Reasonable credit must be extended to the responsible foreign buyer. Credit has become the foundation of our domestic business structure, and in order to build a sound and comprehensive trade in foreign markets, we must have the same foundation and protection, solidifying it by vision, judgment and experience.

We cannot agree with those who maintain that American industry should retire from the commercial battlefield of the world markets. We are no longer sufficient unto ourselves either in production or distribution. We need closer attention with broader vision to make secure a permanent outlet of our commodities, not as a side issue, but as a vitally necessary part of our trade.

This resolution brings up the timely suggestion of the effect on foreign trade of credit extension. Reference has already been made at previous conventions to the operation of the British Government Exports Credits scheme, and in recent years to the insurance of credits by the German Government. Attention has been called to special accommodation granted by German banks in South America and other



loans—while of great value in providing him with the means of more intensive competition, does not offset his deprivation of such large excess of exports over imports as would largely obviate his need for heavy loans.

So long as world consumption (even though expanding at a substantial rate annually) is considerably less than world supply, and there is imperative need for all countries—particularly the debtor countries of Europe—to export largely in excess of their imports, the continued increase of American exports will be resisted to the utmost by our European competitors, and particularly by concessions in prices and extended terms of payment.

Economists who have suggested

*Address delivered at the Fifteenth National Foreign Trade Council, Houston, Texas, April 25, 1928.

markets to customers who patronize German manufacturers, and the easy credit facilities that are possible of extension by European nationals who have been the recipients of generous international loans.

The economic regeneration of Europe, accomplished largely through the aid of American loans, seems to have been too little appreciated by Europeans who have indulged in criticism of American insistence on War loan repayments. The renaissance of Europe, in a brief decade, to a point where, in many lines of exports and imports it is participating to a much greater extent than prior to the war, is due in large part to these American investments in its securities.

One of the most outstanding evidences of the recovery of Europe is the stabilization—either already accomplished or likely to be accomplished in the near future—of the currencies of the principal European nations. While the effect on our foreign commerce of this stabilization of the currencies of nations, which in the aggregate are our best customers, has undoubtedly been beneficial, there are other factors to be considered. One—of prime importance—is the payment of reparations and of international debts incurred for the prosecution of the war and for reconstruction purposes. It is obvious that, in the last analysis, these payments can only be made in the form of European exports of merchandise, and by services rendered, such as, for instance, ocean freight and insurance charges. To the extent that such credits are applied to the payment of reparations or international debts, they cease to be available for payment for American exports. If, therefore, our exports are to be increased, or even maintained at their present volume, the credits available for payment for them must also be increased, either by increasing the volume of our imports of merchandise or by constantly increasing our purchases of foreign securities and extending additional credits. While this, under certain conditions, may be perfectly safe, and good business, it is plain that it has its limits.

Our Real Balance of Trade

In arriving at a correct understanding of what is our real balance of trade, it is necessary to take into consideration what are termed by economists "invisible exports"

and "invisible imports." Among the "invisible exports," which serve to pay for imports into this country, are the dividends and interest accruing on American investments abroad, re-payments of loans and credits extended to foreign debtors and buyers of our products, purchases by foreigners of American securities, and deposits by foreign bankers and other foreigners in American banks. On the other side of the account, the "invisible imports," which serve to pay for American exports, include the dividends, interest and repayments accruing to foreign investors in American securities and foreign depositors in our banks, expenditures abroad of American tourists and residents, and the remittances of immigrants from this country to Europe. After taking into consideration all of these various invisible items on both sides of the account, it is estimated that our total net import balance (i.e., the excess of imports over exports, both visible and invisible) during 1924, was \$1,025,000,000, which is accounted for by sales in the United States of foreign securities, which, it is estimated, amounted during the same year, to a total of \$1,332,000,000.

During the nine years, 1919 to 1927, the value of our total exports of domestic products was slightly under 47 billions of dollars, and of our imports of merchandise, during the same period, slightly over 35 billions of dollars, a difference of approximately 12 billions of dollars which was undoubtedly offset by new American investments in foreign securities during the same period of nine years, to an approximately equal amount, without which it would have been impossible for the foreign purchasers of our products to have paid us for this excess of exports over imports of merchandise.

It is estimated that the total of our foreign investments now amounts approximately to 15 billions of dollars. For the purpose of comparison, it is estimated that Great Britain's foreign investments now amount to at least 20 billions of dollars, on which there is annually accruing a large revenue. During a period of more than fifty years preceding the outbreak of the World War, Great Britain had constantly what economists call an "adverse balance," that is to say, her imports of merchandise heavily exceeded her exports, but nevertheless her wealth and prosperity

continued to expand. During all of this period Great Britain's foreign investments steadily enlarged and were an important factor in increasing her exports of merchandise, but nevertheless the so-called "adverse balance" continued, for the reason that it represented the balance, over and above what was reinvested, of the profits derived from the foreign investments. The experience of Great Britain unquestionably proves that the normal condition of the foreign trade of a creditor nation, such as ours, is what the economists call an "adverse balance"—i.e., so far as excess of imports over exports is concerned—and that any other condition is abnormal and cannot exist permanently.

As our manufacturing industries continue to develop, foreign markets for constantly increasing quantities of our products will be necessary, and we must accept payment for our exports in the only form which is possible to the foreign nations to which we sell, or continue to balance the differences by liberal loans and generous remittances to Europe for expenditures there. If there is a constant increase of our foreign investments and consequently of the dividends, interest and re-payments accruing from them, our imports of merchandise must continue to increase, not only to the extent necessary to cover the so-called "favorable balance" of merchandise shipments, but also, to enable the transfer to this country of the dividends, interest and other payments accruing on our foreign investments in excess of our new exports of capital. There are, in actual practice, only two alternatives, i.e., increased imports or decreased exports. Last year, notwithstanding that our exports of domestic products increased over 1926 by \$46,593,000, our imports decreased, as compared with 1926, by \$246,510,000.

The demand of Europe for our meat and raw cotton accounts for an excess of merchandise exports to that continent, by a billion dollars annually. This is practically offset by our net merchandise indebtedness to Asia and South America, leaving as a net balance our excess of manufactured exports to North America and Oceania, amounting to some 400 million dollars per year. As pointed out, this gain is offset by the fact that our foreign investments are now running at the rate of more than a billion dollars a year and are in excess of this so-called

"favorable balance of trade," but as our prosperity increases, our demand for foreign raw materials is certain to grow, and similar increases may reasonably be expected in the expenditures of our tourists and foreign residents and in immigrant remittances.

Balancing Exports and Imports

We arrive, therefore, at this analysis: our export trade must be encouraged, and increased in every practical way up to the point where we do not invite reprisals from our foreign competitors in both our domestic and our logical export markets, at excessively low prices, based on their starvation wages. We must consider, in many lines, our higher costs, despite the counterbalance of greater efficiency through expert methods and mass production.

On the other hand, if there occurs any serious diminution in the export of American investment capital, we must continue more largely to import, to whatever extent may be necessary, articles of luxury, raw materials and other necessities for our American industry, to the end that the aggregate may counterbalance our increased exports of merchandise. Irrespective of the problematical ultimate payment of all the war debts and adjustment of reparations, we must continue for some time generously to loan our surplus investment funds abroad, in order to complete the resuscitation of Europe and expansion of industry alike for our competitors and customers there, that their prosperity may increase, and that Europe in turn may resume its investments in the consuming countries to the same extent as before the war. This combined investment of the surplus wealth of the major countries can only produce an ever-increasing exchange of exports to and imports from the minor nations, whose assets will continue to expand and whose earnings will provide the means to pay the interest on their liabilities.

It is generally understood that whatever amounts of the German reparation payments (which were made in Germany in German currency under the Dawes plan) were transferred last year from Germany to the creditor nations, were enabled to be so transferred solely because of the existence of credits created by sales of German securities in the United States. In other words, the American investor provided the money for these transfers,

and should he not continue to do so similar transfers will become extremely difficult, if not impossible. At the present time, Germany has no favorable balance of trade; in fact, her imports exceed her exports, largely due to the very great quantities of raw material and food products which Germany must import. It will thus be seen that Germany is under great pressure to increase her exports to the maximum possible extent. German industrialists have been improving their plants and methods of manufacture to a very great extent, and their



efficiency has been so greatly increased that their competition in the markets of the world will doubtless be considerably greater. The operations of their Cartel systems, and export syndicates, are assisting materially in their reconquest of foreign trade lost during the war. As the flow of German and other European products to certain markets, including our own, is restricted by tariff legislation, the efforts of the European nations to sell must be intensified in those markets which are open to them, and that undoubtedly means, in many cases, increased competition with our own manufacturers. As a sequel to the recent Geneva Conference, there was drawn up a convention of 35 nations, which was signed on January 30th by the American representative, and has already been endorsed by 26 other nations. This document undertakes to abolish, within six months after

its effective date, the majority of arbitrary and discriminatory trade restrictions, especially those involving the so-called quota system, which have handicapped the normal flow of trade on the Continent of Europe since the war. A further conference is to be held in May at Geneva to carry forward the program of this convention and to clarify various statistical practices, customs classifications, and nomenclature, which are at present hindering trade. It is to be hoped that this may result in a distinct improvement in the conditions of trade between the nations which are signatories of the convention referred to, including our own, and in order that our share of the foreign trade of the world may be further developed and increased to the fullest possible extent, it is incumbent upon us to do whatever lies in our power to assist in removing whatever restrictions and obstacles at present obstruct and limit our foreign trade.

Our Investments in Latin America

As has been already stated, the constantly increasing investments in foreign countries by Great Britain during a period of more than 50 years before the outbreak of the World War, and which have been continued to the fullest practicable extent since the war, were an important factor in increasing British exports of merchandise. This was due, in large part, to the nature of these foreign investments which did not consist only of loans to foreign governments and municipalities and other borrowers, but of investments in profitable enterprises, including railways, mines, nitrate exploitation, manufacturing plants, and by no means the least important of these investments, the establishment in foreign markets of merchant houses engaged in the exportation of the products of the country in which they were established, and in importing—principally from Great Britain, although not exclusively—whatever products they found to be salable, or for which they could develop a demand in that country. Our own experience in Latin America—especially since the war—has been along similar lines. In 1890, our investment in the southern half of the Western Hemisphere was little better than negligible and only 10 per cent of South America's imports came from the United States. In 1925, our investment in South America had al-

(Continued on Page 5, Adv. Sec.)

Labor as the Outstanding Factor in Port Cargo Handling

By F. P. Foisie, Jacob Wertheim Research Fellow, Harvard University

THESE observations are offered on the subject:

(1) The industry consists of material handling, still largely in the hand-handling stage (except for bulk cargo).

(2) Port cost and port speed are high in relation to sea cost and sea speed; the ship in port does not receive management and engineering attention and ability commensurate with cost.

(3) Longshore labor is the outstanding factor in port cargo-handling; has been given least attention; considered inevitably casual; and looked upon as an irritating necessity.

(4) Evidence in support of these observations is available, but can only be indicated here.

The first observation would seem to be self-evident. Port cargo-handling is a merchandise handling industry similar to the material handling in production processes. The latter is increasingly mechanical-handled; the former continues to be largely hand-handled. It is submitted as explanation for the difference that in the factory the material tends to become standardized, and conditions under close control. Similar trends can be noticed in those shipping lines which are part of an industrial development handling raw materials or finished product. Whatever commercial possibilities may be developed

for soliciting standardized cargoes under controlled conditions of shipment appear to offer opportunities for mechanical handling at lower costs.

The second observation is becoming commonly accepted; port costs and port speed are not receiving the attention they deserve.

By way of cost evidence:

Manchester Liners, Ltd., report costs as 41 per cent of total freight earnings (cost of loading and discharging, 31 per cent of total freight earnings).

The Shipping Board similarly reports port costs on the several trade routes ranging from 25 to 40 per cent of freight earnings.

It is equally significant that a large part of the life of a ship is the unproductive time spent in port, as illustrated by the figures of the Shipping Board that nearly as much time is spent in port as at sea.

Roy S. MacElwee, port commissioner at Charleston, has pointed out that port facilities are as vital as ship facilities, though much less developed. R. I. Dodsworth in an illuminating paper presented at a meeting of the North-East Coast Institution of Engineers and Shipbuilders in February of this year, "Loading and Unloading Facilities on Board Ship and on Land," points out the same weakness, that port design and operation have not kept

pace with ship design and operation. In fact, he goes farther and shows that engineers and operators of ships have progressed more in fitting their ships for sea than for port cargo-handling.

Longshore Labor Need Not Be Casual

But such observations and evidence are old stuff to terminal engineers and accepted by them as their opportunity. What may not be so familiar—or acceptable—is the belief that longshore labor is the root-factor in port cargo-handling; that it has been long neglected and still does not receive anything like the study by terminal operators and engineers that is necessary to progress.

Two wrong theories long held by practical shipping men stand as stumbling blocks to progress. Chief of these is that longshore labor is inevitably casual. Next in importance is the belief among waterfront employers that competition with one another must extend even to securing their labor.

Longshore labor need not be casual. Decasualization is an accomplished thing; the grain shoveling in Buffalo is thoroughly regularized; the cotton screwing in Galveston largely so; the general cargo in Seattle almost completely decasualized. These and other American ventures might be dismissed as small-size, unusual, accidental, or



The waterfront of Seattle, Washington. It was here that F. P. Foisie began his work of decasualizing waterfront labor.



A busy terminal of San Francisco's waterfront. The problems of labor at the port of San Francisco are being rapidly solved.

due to favoring conditions. But several large continental ports have made substantial progress with great masses of men; and most of the English ports would have made greater progress than they have, had trade been other than slack.

The Results of Decasualization

Experience with decasualization shows that a sustained surplus of port labor is not necessary; and that the fringe or surplus is a source of continuous friction and a heavy indirect expense generally. That an industry must support the men it needs is not a maxim but an industrial fact; the difference between industries that recognize it and those that do not is the way cost shows up, whether reflected in wages or hidden in waste.

Competition between waterfront employers should stop with getting the contract and managing the business of handling tonnage, including utilizing but not recruiting labor. Men, management, shipping owners, and the public all profit from a cooperative port labor problem. It is revealing and altogether significant that where there is a close, cooperative association of port employers, there you will find progress in labor relationships, and consequent economies in port cargo-handling. The writer ventures this conclusion from his close observation, that progress in decasualization is directly proportionate to the degree of cooperation practiced by waterfront employers in their labor relationships. On the other hand, strife and other forms of waste

thrive where the individual waterfront employers attempt to go their own several ways. Port labor must necessarily be common to the several employers, certainly so far as the reserve necessary to the fluctuations which confront each employer.

Where decasualization has been effected, the impulse has come either through port employers organizations as on the continent or through the organized workers as in England; or by both working together as in Buffalo and Seattle. The movement has its origin in a desire on the part of the men for a chance to eat regularly and on the part of the employers to be free from fear that the ships will be tied up by strike.

The Position of Machinery In Decasualization

The reason for stressing decasualization to terminal engineers is that the design and substitution of machinery for men will always be impeded where there is an existing fringe of unemployed or underemployed. This is the history of labor's opposition to the iron man; terminal engineers can hardly hope for anything but bitter antagonism from workers already suffering from surplussage.

Examples abound; here is one. It is no accident that winches are driven double on the Pacific Coast and single on the Atlantic. There will be various explanations given, some sound, some unsound; but the chief one is that there is no sustained surplus on the West Coast

and there is on the East. Longshoremen in Atlantic Coast ports allege driving winches single is safer. Any winch driver who drives double or single knows the contrary; it is easier to coordinate two hands through one mind than two men through a third (signal) man. A group of General Electric Company engineers, while designing that company's recently marketed electric winch, observed and remarked on the greater cooperation they received from winch drivers in San Francisco than in New York. Again the explanation lies in the difference in eating habits—regular versus occasional.

It seems fatuous to rail at the workman who opposes the introduction of a machine which is to put fear of unemployment into his heart. Is it asking too much that the man of science who designs a machine to produce a desired material result so introduce it as to produce also a desirable human end? It is more difficult to reduce to exact measurement human values than material ones, but not too difficult.

Mechanization of port cargo-handling is very much to be desired. It is surely a high professional service to replace the workman with an iron man where strain, fatigue, chronic under-employment, and personal injuries take such awful toll as in longshoring.

"Muling" cargo is still the rule; long stretches of exhausting work, marked off by periods of en-

(Continued on Page 9, Adv. Sec.)

An Interesting Moderate Sized Motorship

ON May 12 Burmeister & Wain of Copenhagen ran successful trials on the motorship Bretagne, built by them for the Dansk-Franske Steamship Company of Copenhagen for the Antwerp-Venezuela trade and general cargo tramp service.

This motorship was built to special survey under British Lloyds, Class 100-A-1 rating, with free-board. Her general characteristics are:

Length between perpendiculars	325' 0"
Beam, molded	49' 10"
Depth, molded to main deck	23' 0"
Draft, loaded	20' 6"
Deadweight capacity, tons	5500
Gross tonnage, registered	3177
Net tonnage, registered	1931

She has five water-tight bulkheads, five hatches, and three cargo holds arranged as shown on profile and plan herewith. She can carry 500 tons of fuel oil, 304 in double bottoms and 196 in the deep tanks just forward of engine room. This fuel capacity gives the Bretagne a cruising radius of 24,000 miles.

Her hatches are all 20 feet wide and vary from 24 to 30 feet in length. Three of these hatches, Nos. 1, 2, and 5 are trunked with the trunks extending the full length of the walls forward and aft.

Ten cargo derricks are fitted and ten 3-ton electric cargo winches,



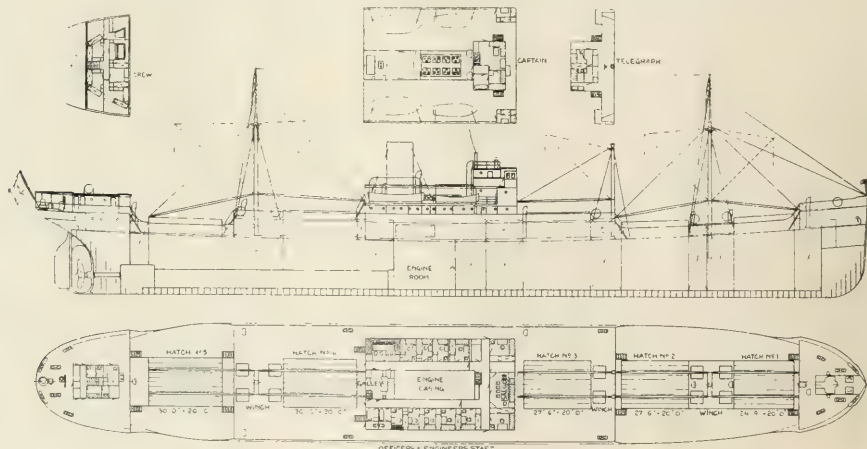
Motorship Bretagne on her trials.

one 5-ton electric capstan, and one electric windlass. Electric light and power are provided by one 66-kilowatt and two 33-kilowatt Burmeister and Wain diesel generating sets and an automatic Delco set for emergencies or for furnishing light when all machinery is shut down. Quarters for captain and officers and two guest cabins, together with dining saloon and three bath rooms are in the bridge erection amidships. Crew's quarters are aft in the poop with nice three-berth cabins. Steam heat for quarters is provided through an oil-fired donkey boiler. A Frigidaire machine insures cold storage.

Propulsion machinery consists of

one single-acting long-stroke cross-head type, 6-cylinder standard Burmeister & Wain diesel engine with a rated capacity for 1600 indicated horsepower at 95 revolutions, which it was estimated would drive the ship at about 10½ knots on a daily fuel consumption of 5¼ tons.

On trials this power plant developed 1891 indicated horsepower at 109 revolutions and drove the Bretagne at 11.8 knots an hour over the Hveen measured mile. On a two-hour fuel consumption test she showed an average indicated horsepower of 1835 and a fuel oil consumption of 0.296 pound per indicated horsepower hour.



Profile and deck plan of motorship Bretagne.

New Hamburg-American Motorships

THE new Hamburg-American Line motorships San Francisco, Los Angeles, Seattle, and Portland are being placed in freight and passenger service between Hamburg and United States West Coast ports as soon as they are delivered by the builders. The San Francisco and Los Angeles are already on the job.

These new vessels, of 6500 gross register tons, are 430 feet long, 59 feet wide, and 38 feet deep. They have a speed of 13 knots. They conform in general appearance to single stack, two masted steamers, with superstructure amidships containing the passenger accommodations and navigating quarters.

The cabin accommodations, for 24 passengers, are located on the promenade deck, above the main hull structure and they compare favorably with first-class facilities on large passenger steamers. The public rooms at the forward end of the superstructure are attractively furnished. The dining room, located amidships, seats 31 passengers; it is finished in light-colored lacquer. The smoking room, on the port side, paneled in oak, is comfortably furnished to afford pleasant environment during the voyage; and the ladies' parlor, on the starboard side, attractively decorated in light-colored birch wood, with gobelin tapestries to decorate the walls, contains a piano and library cabinet among its convenient and comfortable furnishings. Each stateroom contains two beds, a sofa,



Hamburg-American Line motorship Los Angeles.

which can be converted into a child's bed, a table, a wardrobe, and a washstand with running water for each passenger. The deck space is extensive for promenading and sports; part of it is glass enclosed to protect the passengers from wind and rain during bad weather.

The third-class accommodations, which will take care of 24 passengers, are located on the main deck, and the deck space allotted for the passengers' use in the after part of the ship affords ample room for deck sports, entertainments, and promenading.

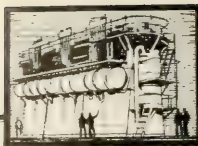
In addition to the comfortably furnished dining room, which is located at the after end of the super-

structure and the small semi-enclosed arbor just behind, which is used as a gathering place, there is a small deck house at the stern of the ship for use as a lounge or smoking room. The staterooms, light and well ventilated, contain two or four beds each, and a washstand with running water for every two persons.

The cargo facilities are ample and modern and certain sections are equipped with refrigerating apparatus of the latest type. The offices of the purser, the chief steward, the doctor's quarters, the barber shop, and radio office are conveniently located to provide easy access for the passengers.



At the left: a corner of the social hall, motor ship Los Angeles.
Above: first class dining saloon.



In the Engine Room

Wave Power

LIEUTENANT-COMMANDER LYBRAND SMITH of the Bureau of Engineering, Navy Department, Washington, has revived discussion on Wave Power by his excellent paper printed in the September issue of Mechanical Engineering. As this subject is of perennial interest to marine engineers, we are here abstracting that paper in the hope that it may draw out some comment from the engine room or the bridge.

Lybrand Smith points out the very obvious conclusion that for practical use the intermittent kinetic energy of the wave must be converted to and stored as potential energy and that a practical machine for such purpose must have the following fundamental characteristics:

- a. It must be a rugged structure.
- b. It must be of simple form with few moving parts. (Both requirements are obvious to one familiar with the destructive force of sea waves).
- c. It must be capable of vertical adjustment for height of tide.
- d. It must be capable of horizontal adjustment when, on different days, the waves break at different distances from the shore because of the effect of different tides or winds.

e. It must convert the kinetic energy of the wave (the form in which most of the available energy exists) into potential energy with a minimum loss.

f. The receiving end of the machine should be in deep water where the waves have more power; while the operating end should be in shoal water (or on land) where the waves will not cause damage.

The form of design to meet these requirements is shown in the diagrammatic sketch reproduced herewith as Fig. 1. A is a hydraulic ram with waste valve, nonreturn valve, and air chamber. B is a straight long

pipe leading out to sea. C is a funnel with its open mouth, D, at the seaward end of this pipe. The floor of this funnel is raised at E to form a dam, which in conjunction with the flap valve, F, pivoted at G and stopped at H keeps the pipe full of water and prevents the rebounding seaward of the water column. To provide for escape of imprisoned air, a vent, I, is provided with a hollow ball valve, J. It is evident that if the apparatus be placed with the open mouth of the cone facing waves and the pipe be full of water then that portion of a wave entering the funnel will increase its velocity and will impart a certain amount of dynamic energy to the water in the pipe. If this energy be powerful enough to close the waste valve, then a water hammer ensues which will operate the ram to lift a part of the water to the desired height.

The power available per foot of wave front for varying conditions is calculated by the author to be according to curves shown in Fig. 2. A 4-foot wave in water 30 feet deep would be a very usual condition on many of our coasts, and such a wave would have 5.45 horsepower per foot, or 28,816 horsepower mile of front.

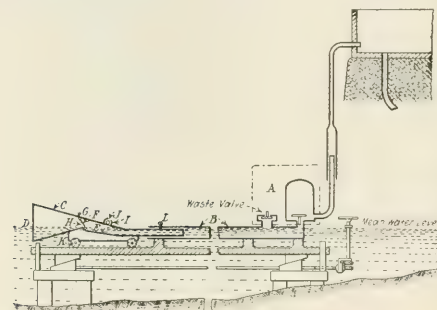
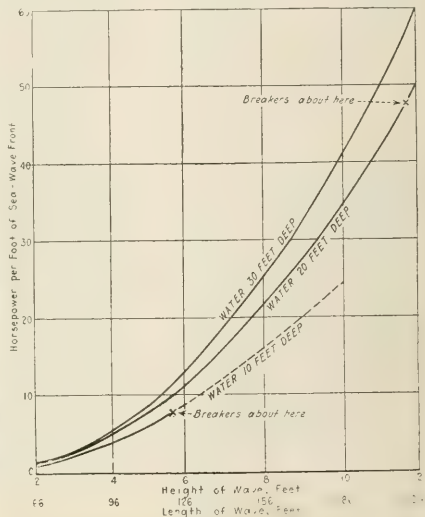


FIG. 1. DIAGRAM OF A DEVICE FOR USING WAVE POWER



Certain assumptions as to efficiencies of the various parts of this type of apparatus lead to the conclusion that about 60 per cent of the kinetic energy of waves can be converted and stored in elevated reservoirs as potential energy.

To prevent storm damage, "air break water," or the subsurface release of bubbles of compressed air, is suggested. On the majority of the American coastlines there would be very little interference from ice.

Lybrand Smith puts this idea forward merely as a theoretical discussion and says in conclusion:

It is believed that the above discussion suggests the method of building a practical, reliable machine for utilizing wave power. The changing of the suggested method into actual practice is a challenge to competent industrial engineers.

[Editorial Note.] The article on wave power, above, and that on welding, below, are introduced into this section of Pacific Marine Review because we are wanting to start discussion of these two subjects among marine engineers.

It will be noted that the author of the paper on Wave Power, from which our article is extracted, is, himself, a marine engineer in the United States Navy. His purpose in preparing this paper was to get engineers into a discussion of ocean waves as an economical source of energy. This subject, as one for discussion, has probably received more attention from marine operating engineers than from any other class of men. Let us know what you think of the possibility of using wave power in general and of the suggested scheme in particular.

Marine engineers are in a position, also, to observe and, to a certain degree, test the results of welding on the structure of the hull and on marine machinery. If you are shipmates with a welding job, let us know how it is holding up.

Welding at Newport News

THERE may be more than passing significance in the fact that the winner of the Lincoln Electric Company international competition for the best paper on welding was J. W. Owens, director of welding at the Newport News Shipbuilding & Drydock Company. This contest for a first prize of \$10,000 was held under the auspices of the American Society of Mechanical Engineers. Mr. Owens has written several books and papers on welding and allied subjects and has had a vast deal of experience during the last ten years in welding as applied to stationary and to floating structures. Of his more recent experiences at Newport News, the Journal of the American Welding Society gives the following interesting resume:

"When Mr. Owens took up his duties with the Newport News Shipbuilding & Dry Dock Company in Newport News, Virginia, as their director of welding, on January 1, 1926, the yard had twenty-two metal arc welders, and, although more or less equipped to employ the various welding processes, nevertheless the utilization of the fusion welding processes in new construction was negligible. Except in the manufacture of rack racks, a limited number of tanks, vent ducts, and in locomotive repair, welding was primarily used to salvage defective castings and to fill mispunched holes in structural work. During the two and a half years in which he has been associated with this company,

welding has assumed the status of an operating department and is now extensively used on all classes of steel construction work undertaken by the company, including ship construction, building construction, pipe lines, and hydraulic work in general. At the present time there are about sixty metal arc and eleven gas welders on the rolls.

"In ship construction, the Newport News Shipbuilding & Dry Dock Company used metal arc welding more extensively in the construction of the Coast Guard cutter Northland, launched February 5, 1927, than any ship of its size constructed in the world up to that time. Its decks and superstructure are very largely welded; it has a completely welded rudder and four seams at the waterline are welded in addition to being riveted in the usual manner, so as to enable the hull to more effectively resist ice pressure in Arctic service. At the present time approximately 600 pounds of electrodes are being used per day and a total of 30,000 pounds were used on the steamship California of the Panama Pacific Line, which was launched October 1, 1927. It is probable that 60,000 pounds of electrodes will be used on her sister ship, the Virginia, which is now under construction.

"In steel building construction there has been erected a 50 by 60-foot completely metal arc welded extension to the company's foundry cleaning room, together with a 10-ton, 50-foot span, overhead traveling crane which will serve the building."

The Pacific's Largest Motorship

THE Aorangi (Cloud Piercer) of the Union Steamship Company's Vancouver-Sydney service, is a splendid example of the application of diesel engine drive to a modern passenger liner. Attention has been directed to this fine vessel recently through the newspaper report that on her last voyage she cut 18 hours off her regular schedule.

The Aorangi probably covers more nautical miles per year than any other motorship afloat. She has a sea speed of better than 18 knots and makes the round trip between Vancouver and Sydney every eight weeks. With the exception of one round trip lay-off for overhaul of the ship, she has kept this schedule with mathematical exactness for three and a half years.

The distance from Vancouver to Sydney is 7638 miles, making the yearly mileage of the Aorangi 99,294 miles. The total mileage of this vessel, including the trip out from Glasgow to Vancouver and a side trip from Sydney to Wellington on her first voyage, figures approximately 355,000 miles.

The Aorangi has four Fairfield-Sulzer, 2-cycle type single-acting, 6-cylinder engines, with a cylinder bore of 27 $\frac{1}{2}$ inches and 39-inch stroke, each engine developing 3250 brake horsepower. Each engine is direct-connected to a propeller shaft.

Since her first trip the Aorangi has been using the Union Oil Company's diesel fuel oil, and her lubricating oil has been cared for by a Sharples centrifugal oil purifier.

The fuel consumption works out at 859 tons for main engines from Sydney to Vancouver on a recent trip and 202 tons for steam auxiliaries. The Aorangi carries two Scotch boilers for power for steam pumps, for heating system, and for galley use.



Workboats and Their Power Plants

Tuna Fishing Schooners Under Construction in San Diego

THREE vessels are being built by the Campbell Machine Company, San Diego, to the designs of Manuel Madruga, which are to have identical hulls, 115 feet long, 25 feet beam, and 8 feet depth.

One vessel is for Joe C. and Matthew Monise and is to be powered with a 350-horsepower, 7-cylinder, directly reversible Union diesel engine.

One vessel is for Manuel Silvers & Son and is to be powered with a 300-horsepower, 6-cylinder, directly reversible Union diesel engine.

The third vessel is for John Cardosa and is to be powered with a 300-horsepower, 6-cylinder, directly reversible Union diesel engine.

All three vessels will have the following equipment:

A Campbell Machine Company cargo winch and anchor winch, and a 5-8 ton York refrigeration unit, all driven by silent chain from the line shaft.

A 32-volt lighting system with 52 volt, type B4H Edison batteries; 30-volt Westinghouse direct-current generator.

A 24-horsepower, 2-cylinder



The boatyard of the Campbell Machine Company, San Diego, showing several large fishing schooners under construction.

Union diesel stationary engine and a 22-horsepower, 4-cylinder Fordson gasoline tractor engine for auxiliary power, with belt drive arranged from these engines to a line shaft from which power is taken for different auxiliaries.

Two 5-inch De Laval split-case centrifugal pumps, piped from sea to bait boxes and bait wells to supply sea water to live bait.

One 2-inch Campbell Machine Company centrifugal bilge pump.

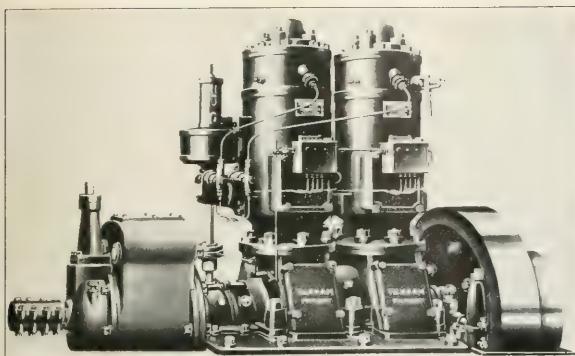
In addition there is being constructed at the San Diego yard of Peter Rask a tuna fishing schooner 100 feet length by 25 feet beam which will be powered with a 300-horsepower, 6-cylinder, directly reversible Union diesel engine. The equipment for this vessel will be the same as that described above for the three vessels which are being built by Campbell Machine Company.

Delano Brusstar is building a 118-foot by 26-foot beam hull which will be equipped with a 400-horsepower, 8-cylinder, directly reversible Union diesel engine. This will be the most expensive fishing schooner yet constructed on the Pacific Coast.



An interesting conversion job in the San Francisco yard of Anderson & Cristofani. A 52-foot U.S. Navy launch being lengthened and rebuilt for Captain P. Stanbourg. This boat will have a special arrangement of one-man control from the wheel house.

San Francisco Bay boatyards are well equipped for the rapid and good construction of workboats,



As was announced in the July issue of *Pacific Marine Review*, the F.A.B. Manufacturing Company of Oakland, California, has secured the license to manufacture Tuxham low compression diesel engines in the United States and Canada.

We show above a 2-cylinder marine type Tuxham fitted with reverse gear as it will be sold to the fish boat operators of the Pacific Coast. This reverse gear runs in oil and its control wheel is carried above deck as well as the control wheel for the engine governor.

The F.A.B. Manufacturing Co. will have one of these engines on the test floor very shortly.

and a great many of these craft have in the past been turned out here. However, the yards at San Pedro, Newport Beach, and San Diego are bidding strongly for this class of work. Fishing workboat building is a bit different from towboat building, though the differences are not particularly no-

ticeable to the layman. Still a yard that has specialized on one particular type is obviously better able to bid low and turn out a good job than would an establishment which had never taken on this sort of business. The field just now is a broad one for this industry, and no doubt many of the additional hulls

which will be needed to keep the fishing fleet up to date will be built on San Francisco Bay. And those built here will be equal to any.

The fisher workboat *Funchal*, recently launched at **Nunes Brothers Yard**, Sausalito, is the largest of her type yet built on San Francisco Bay. Her length of 112 feet, good lines, and full power will make her a fine offshore craft. She will be put into the San Diego tuna fishing business as soon as commissioned. A complete refrigeration plant to chill 150 tons of fish will be installed, insuring proper preservation of her catches.

Two Maxim silencers have been installed in the new yacht building at San Diego for Baron Long. These silencers are of the 6-inch and 8-inch type, and will reduce the noise of the big diesel to a minimum, in fact the plant will be practically noiseless, only a muffled murmur being heard when the engines are at their highest speed. E. V. Winter, Maxim Silencer Company representative at San Francisco, states that the Maxim Silencers are the best on the market for exhaust noise elimination. It would appear that they are almost a necessity where heavy power units are employed.

Diesel Engined Trawler

DURING the summer of 1925, the steam trawler *Ripple* was purchased by the Massachusetts Trawling Company of Boston and was converted to diesel power at the shipyard of the New London Ship & Engine Co. at Groton, Connecticut and renamed *Boston*. Many radical changes were made in the entire boat. The mizzen mast was removed, new deck houses were built, and by virtue of the space saving qualities of a diesel installation a much larger fish hold was made possible.

The trawler *Boston* has a length over all of 121 feet 6 inches, a beam of 22 feet 3 inches, and a draft of 13 feet. Her main engine is a Nelsco diesel directly reversible, 6-cylinder, four-cycle, mechanical injection type, commonly known as Model 6 MIR-18, which develops 345 shaft horsepower at 275 revolutions per minute. This type of engine has a fuel consumption per hour of slightly less than 20



Inboard profile and hold plan of Ingersoll-Rand diesel engine tug *Samson*. This type of New London Ship and Engine Company.

gallons.

A 2 MI-18 Nelsco diesel, develop-

ing 100 horsepower at 260 revolutions per minute direct connected

to an Electro-Dynamic Co. direct-current generator delivering 65 kilowatts at 250 volts, furnishes the power necessary for the auxiliary machinery.

An auxiliary air compressor generator set, consisting of a 10-kilowatt, 250-volt, direct-current Electro-Dynamic Co. generator driven by a 15-horsepower Venn Severin diesel engine, supplies the necessary current for small auxiliaries and lighting. A 5 cubic foot capacity Nelsco type air compressor for emergency use is clutch-connected to this engine. The main air compressor is a 10 cubic foot Norwalk type, driven by a Morse silent chain from the forward end of the main engine.

The main engine circulating water, lubricating oil, and fuel oil transfer pumps are built integral and are driven from one end of the cam shaft. The auxiliary circulating water pump is a Gould centrifugal, motor driven, with a capacity of 100 gallons at 1740 revolutions per minute. This pump is also used as an auxiliary fire and bilge pump. The fire and bilge pump is a Gould Pyramid, delivering 28 gallons per minute, and is chain driven from the main shaft. Gould hand pumps are used for the auxiliary pumping of lubricating and fuel oil.

The maneuvering air storage bank consists of four 10 cubic feet air flasks. The whistle system consists of a Strombos air whistle connected to an air tank, tested to 300 pounds per square inch.

The inner bottom water tanks of the trawler were tested and made oil-tight and are used as the main fuel oil tanks. These have a capacity of about 10,000 gallons. A cylindrical tank of 320 gallons capacity is used as a main lubricat-

ing oil tank. Lubricating and fuel oil gravity tanks of 25 gallons capacity are installed for each engine. A suitable switchboard, located in the forward end of the engine room, provides adequate control of electric power. The engine room is spacious and well arranged, providing easy access to all machinery.

The main windlass used in trawling is located on the main deck at the forward end of the house. This was converted from steam to electric power. A small electric winch furnishes the necessary power for the hoisting of fish from the main hold. This is located on the main deck just forward of the main mast. The heating system consists of an American Radiator Company steam boiler, connected to radiators in all quarters. Brass radiators are installed in the pilot house.

The crew's quarters are located aft, between decks, and provision is made for fourteen men. The engineers' quarters are in the after end of the main house. Forward of the engine room are quarters for the oilers and the cook. Just aft of the pilot house are quarters for the captain and mate. The galley and mess room are between decks, below the windlass room. There is a lamp room on the starboard side of the main deck house which is completely sheathed with galvanized sheet iron. Provision for net stowage as well as ship's stores has been provided in the space under the forecabin deck.

The fish hold is insulated with pressed cork over which is secured 2-inch spruce ceiling. Suitable division bulkheads forming fish pens are built into the fish hold to facilitate the stowage of fish. Either side of the main hatch are six fish

pens. Capacity of fish hold is 28 by 20 by 10 feet deep, about 250,000 pounds. There are four galleys frames, two located port and starboard abreast of the mast and two port and starboard near the after end of the main house. Large electric flood lights provide ample light on deck for night work. The steering gear is of the hand type, iron rods being used in the straight runs near the rail. Large hinged scuppers in the bulwarks permit any water taken on the decks to run off quickly. A unique arrangement of two booms on the main mast aids in the rapid unloading of fish.

On the trial run, the Boston made 9.56 knots with fuel tanks full of oil, and her fuel carrying capacity permits a cruising radius of over 4000 miles.

Equipped as she is with the most modern propulsive and deck handling equipment for fishing, and the hull being in excellent condition, the trawler Boston should serve her owners for many years in a most reliable and economical manner. Although no figures are as yet available on savings and operating costs, it can readily be assumed that with her diesel equipment she is effecting large economies as compared to the obsolete steam trawlers of her type. Another important advantage of the diesel engine from the fisherman's standpoint, in running from the fishing banks to port or vice-versa, is in the steady continuous output of power which permits the skippers to judge the time accurately for making the run. With her good turn of speed, this up-to-date vessel compares favorably with any of the big trawlers working out of Boston.

High Powered Workboat on a Long Salvage Cruise

THE longest rescue cruise in maritime history has been brought to a successful conclusion by the Merritt-Chapman & Scott salvage steamer Peacock. This voyage, which involved a 17-day run of 4600 sea miles from her San Pedro, California, base to Nukulailai Island in the South Pacific, below the equator, was undertaken by the Peacock to float the Isthmian Line's stranded cargo steamer Steel Maker, which was driven on to the jagged coral rocks of Nukulailai during a sudden tropical storm on March 26, with 5000 tons

of chrome ore and other cargo in her hold.

Nukulailai, which is sometimes called Mitchell Island, is one of the Ellice Group in the South Pacific Ocean and lies latitude 9 degrees 30 minutes South; longitude 180 degrees; its distance from the salvage company's San Pedro base is about that of a voyage from New York to Europe and half way back. The Peacock, a steam screw vessel of the Navy mine-sweeper type, 741 tons gross, with engines of 1400 horsepower, made the trip in 17 days, stopping only six hours in Hono-

lulu Harbor to replenish fuel and take on stores.

When the Peacock arrived at the scene, the wreck was found to be lying on a coral reef in the open sea, in a location which afforded little or no protection from storms, heavy swells, and strong currents. Her keel was broken, her bilges crushed in, and the jagged rocks on which she rested had seriously injured her bottom. So heavy was the sea that it was impossible for the divers to apply emergency patches, as usually is done; they could do little more than to survey



The salvage tug Peacock of the Merritt, Chapman & Scott Corporation.

the condition of the hull and provide data for the salvage master's plans.

Fourteen hundred tons of cargo was jettisoned from Nos. 2 and 3 holds, and five powerful gasoline salvage pumps, capable of handling

15,000 gallons of water a minute, were set up in one of the holds and worked to capacity. Twelve days and nights of this continued effort floated the Steel Maker and freed her from the strand. Then, with the five big pumps barely control-

ling the flow of water through the rents in the ship's bottom, the expedition on May 3 stood off for Pago Pago, Samoa, 750 miles away, the nearest safe harbor in which the divers and salvagemen could proceed with the temporary repairs. This long tow was made in six days, arriving in Pago Pago May 9.

Meanwhile, the salvage crew had made temporary repairs to the hull and conditioned the Steel Maker's engines so that on Tuesday, July 10, she set out on the long return voyage of 7800 sea miles to New York via the Panama Canal. She will travel under her own power and without convoy, the Peacock returning directly to her home station at San Pedro.

More than \$30,000 worth of fuel oil will have been consumed by the time the Steel Maker reaches New York and the Peacock her base in California.

The steamship Steel Maker, built in the year 1920, is a steel cargo vessel of 6187 tons gross, 3821 tons net, and belongs to the Isthmian Line, an operating subsidiary of the United States Steel Corporation.

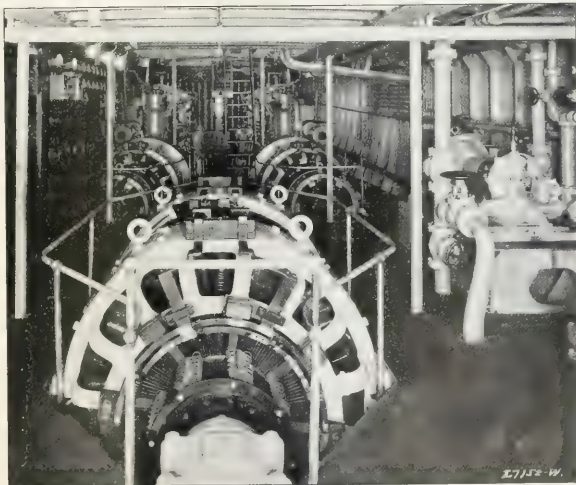
Westinghouse Equips Two New Diesel-Electric Tugs

THE award of the contracts for the complete electrical equipment to the Westinghouse Electric & Manufacturing Company for two new diesel-electric tugs for the Pennsylvania Railroad was recently announced. These new boats will increase the Pennsylvania Railroad's fleet of diesel-electric tugs to nine, all of which are electrically equipped by Westinghouse.

The two tugs will be similar in all respects to the P.R.R. Nos. 16, 18, and 26, the No. 16 having been built in 1924 while the Nos. 18 and 26 were completed in 1926. The principal dimensions of the two craft will be as follows:

Length overall	105 ft.
Beam molded	24 ft.
Draft	12 ft.
Gross tonnage	186
Speed light	11 3/4 knots

The propelling equipment will consist of two main generating units and a double armature propulsion motor. Each generating unit will comprise a 375 brake horsepower Winton engine, driving a 250-volt, 235-kilowatt generator and a 25-kilowatt exciter at 260 revolutions per minute. The generator and exciter will be directly



Power plant of the Pennsylvania Railroad Company's tug No. 16. The Pennsylvania fleet includes nine diesel-electric tugs building or in commission.

connected to the engine shaft. Control will be arranged for both pilot house and engine room, the Westinghouse variable voltage system



Auxiliaries-Ship Supplies-Marine Equipment

Map of Ocean Floor

International Hydrographic Bureau Plan to Make Chart of Sea Bottom from Fathometer Soundings

COMPLETE maps of the seven seas of the world, showing the hills and valleys of the ocean beds as thoroughly as is now done on land, will be undertaken by the International Hydrographic Bureau if the latter adopts the proposal submitted to it by G. Renius, the Swedish hydrographer. By use of echo-sounding apparatus it is possible to draft the contours of land beneath the seas with complete accuracy. Maps of this kind will enable ocean liners to make use of landmarks under the water for safe navigation in the same way that aviators now follow the courses of rivers, mountains, or railroads.

Mr. Renius' proposal was made after a voyage on the steamship *Columbus* of the North German Lloyd line, which is equipped with a Fathometer. This instrument measures, through the most accurate method yet devised by science, distances under water as great as three miles. This is accomplished by calculating the elapsed time between the production of an electrical sound and return of the echo, which is translated automatically into fathoms on a clocklike dial. As more ships are equipped with similar instruments in rapid succession, the ocean lanes may be thoroughly mapped through coordination of this information, using the International Hydrographic Bureau as a clearing house.

The statement of Mr. Renius follows:

"It will soon happen that the large liners will be successively supplied with echo-sounding apparatus, and consequently their routes or routes-zones will, in course of time, be sounded to a hitherto unknown density. In order that these soundings may be of the largest possible use to navigation in general there will be need for a central international organization which

should try to stimulate the respective companies to take such soundings as well as, later on, to send in the results to appropriate hydrographic offices or to the Bureau.

"For states which publish charts of the whole world, the results might be sent in by the respective companies to the national hydrographic office, but for other countries it would be simpler, without doubt, to send echo-sounding results to the Bureau, to be distributed

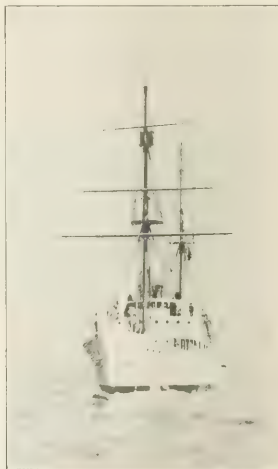
should accompany the data.

"Regarding the rest of the merchant marine, the arousing of interest in practical participation in this work might very well be postponed for the present.

"On the contrary much valuable aid might be counted on from all naval vessels making expeditions every year. These vessels have considerably greater liberty in choosing their routes on the oceans, and thus our knowledge of the depth conditions within areas alongside or between the liner tracks might be completed later on. However, it must evidently be assumed that the work will be systematic and planned internationally if the results are expected to be at all fruitful within reasonable time.

"If it be possible to carry out this proposal, it must necessarily be taken in hand by the Bureau. The beginning might be made on a comparatively small scale, and, after gaining the necessary experience, a final scheme which is capable of being successively enlarged, may be put into operation. Perhaps it may be possible for the Bureau to consider this question, in its various aspects, more thoroughly than has been feasible here and, eventually, to place the question before the Conference in 1929. The task may possibly seem alarmingly large; but with support from the hydrograph offices interested, this purely hydrographic question might certainly reach a practical and fruitful solution."

The Fathometer has already been used on torpedo boats of the United States Navy for making such maps of the continental shelf along parts of the Pacific Coast. Such map, or Bathometric chart of the California Coast from San Diego to the Golden Gate, was published in a former issue of *Pacific Marine Review*. The cruiser *Seattle*, a few



The U.S. Coast Guard cutter *Northland*, whose officers have found the Fathometer a very useful assistant.

buted to those countries which publish charts of the areas concerned. To give real value to these results coming in from varying sources it would be necessary to recommend certain standards regarding the sounding work and to lay down the additional information which

years back, led the Pacific battle squadron from Seattle to the Golden Gate in a dense fog by picking up well-known bottom marks through her Fathometer soundings and thus checking dead reckoning at the crucial points of this dangerous coast.

The following letter indicates the high regard in which the Fathometer is held by Coast Guard officials who have been shipmates with this efficient leadman.

"Editor, Pacific Marine Review.

Dear Sir,—On May 7, 1928, the Fathometer on the Coast Guard cutter Northland has been in operation, off and on, for one year. It has given excellent results, and is considered by the officers on the Northland to be one of the best

navigational instruments and safeguards ever carried by a seagoing vessel.

The Northland is required to make arctic cruises each year in waters of which the soundings are most unreliable, formerly requiring constant use of the hand lead. With the present Fathometer sounding device soundings may be made at an instant's notice by the officer of the deck, and the soundings are found to agree within a half-fathom of the hand lead soundings.

I cannot too strongly recommend the Fathometer to any seagoing vessel.

R. E. Wood, Lieut. (j.g.),
Navigating Officer,
Northland."

Air Travel Popular

AVIATION history is now being written in California. Strongly assisted by the Daniel Guggenheim Fund for the Promotion of Aeronautics, Western Air Express, Inc., is proceeding with a commercial aerial project the progress of which is being watched closely by all who are interested in commercial transport by air. Success of this project will prove a boon to aeronautics in all the nation, for it will demonstrate that the people of the United States are ready to ride, as paid passengers, on a fully equipped, carefully conducted aerial transport line.

The service was established Saturday, May 26. It will take some months to tell the full story. Accurate judgment on a transport system, considering all its ramifications, cannot be had within a few weeks. The elements of newness and curiosity must be eliminated. In their place must be established the confidence that can be secured by the regularity and efficiency of the service.

This confidence, reports Mr. Han-shue, president of Western Air Express, is being established. As evidence of this he cites the fact that a group of twenty-four bankers made the flight from San Francisco to Los Angeles in one day to attend a state bankers convention, and bankers are notoriously conservative. Many women have made the flight on the California passenger line and they have become enthusiastic boosters for the service. The cleanliness of aerial travel appeals to the women and the beauty of the panorama of California from the air enralls them.

One San Francisco woman wished to celebrate her eightieth birthday with her two daughters, one living at Oakland and the other at Pasadena. She had a birthday breakfast with the Oakland daughter, then boarding a Western Air Express plane flew to Los Angeles for a birthday dinner with the Pasadena daughter. And this 80-year-old woman enjoyed the flight immensely.

The Guggenheim fund supplied to Western Air Express, under an equipment trust contract, three Fokker monoplanes, which are equipped to carry twelve passengers, two pilots and 1000 pounds of cargo. They are operated by three Pratt-Whitney Wasp motors developing a total of 1275 horse power and can maintain a speed, when

fully loaded, of between 120 and 150 miles an hour.

The schedule calls for the trip between Los Angeles, Oakland and San Francisco to be made in three hours. It takes the fastest train twelve hours to make the same journey. One plane has made the journey southbound in 2 hours, 28 minutes, averaging approximately 150 miles an hour for the entire trip. Since the service was established May 26 the reports show the planes have left on the minute every day and the schedule has been carefully adhered to.

Passengers ride in heavily upholstered chairs. There are individual ash trays for those who desire to smoke. Running the full length of the cabins, on either side, are racks for light baggage. Two large compartments provide space for heavier baggage. To the rear of the cabin is a fully equipped lavatory. Start of the flight is made each morning at 10:30 a.m. and at noon luncheon is served while the passengers are high in the air. Arrival is made at point of destination at 1:30 p.m.

The service, reports indicate, has been found of great value by business and professional men and women. One large oil company, with interests in the three cities served, has adopted the policy of moving its executives back and forth on these ultra modern planes. Banking groups, which operate in the three cities, have adopted a similar policy. Aviation experts say that no man or woman, whose time is worth \$10,000 or more a year, can afford to travel by any other means than by airplane.

San Diego Air Show

FOUR hundred airplanes all in the air at the same moment will be one of the features of a great aviation show to take place at San Diego, August 16 to 18 inclusive, and which is sponsored by the San Diego Chamber of Commerce in co-operation with the United States government air forces.

The program includes smoke screen laying, parachute jumping, and exhibitions of combat flying. Nearly 600 aircraft will be on exhibition, in addition to a comprehensive display of aviation accessories and the latest aids to air navigation.

Other events of the Western Aviation Progress Exposition will include the dedication of San Diego's

fine new airport, Lindbergh Field. The dedication will take place on the morning of August 16 in the presence of a distinguished group of nationally famous airmen and government authorities.

LUX EQUIPPED

Marine Engineering and Supply Company of Wilmington, California, advise that they have recently installed Lux automatic fire extinguishing apparatus on the cruiser Enao, owned by E. E. Converse of Santa Paula.

The same equipment was also installed on the Callis designed, 36-foot, rib deck, power cruiser, Brownie Bee, owned by E. W. Bennett of the Utility Tractor Sales Co., Los Angeles.

Service Without Limitations

AN opportunity is seldom presented to get anything like a complete picture of the significance of an industrial process to men and to corporations engaged in many different lines of production. One of the newest processes in the metal working industries is that of oxy-acetylene welding which, while it is used only in connection with metals, has found application in scores of places not ordinarily classed as metal working plants.

How this process has grown to be an important factor in almost every phase of human activity is illustrated in the outline of topics covered in a report of the Oxy-Acetylene Committee of the International Acetylene Association which is being prepared for presentation at the meeting of this association next November. The following is a list of some of the more important subjects which it is considered necessary to cover in the annual report:

Acetylene generators,
Welding and cutting apparatus,
Welding supplies,
Steam railways,
Street railways,
Marine,
Airplane,
Oil industry,
Automotive,
Steel furniture,
Power plants,
Heating and ventilating,
Pressure vessels,
Structural steel,
Boilers,
Pipe lines,

Steel mills,
Foundries,
Textile mills,
Automatic machine cutting,
Automatic machine welding,
Testing welders,
Training welders,
Sheet metal,
Ornamental iron works,
Metal spraying,
Bronze welding,
Domestic automatic refrigeration,
Commercial refrigeration,
Hard facing tools,
Mines,
Lumber and wood products,
Heat treating,
Highway construction,
General contract operations,
Status of welding in engineering schools,
Research,
Procedure control,
Welding ferrous and nonferrous metals,
Rules governing the industry,
Status of job welding.

One who has the opportunity to see only one or two simple welding operations seldom realizes that over a hundred thousand of these torches are in daily use in the country, and on so many different kinds of work that it has never been possible to compile a complete list of its uses. The above set of topics is not an attempt to show all the uses of oxy-acetylene welding, but just an outline of the more important subjects which are under consideration at the present time.

Modern Automatic Light Beacons

THE new aviation beacons now erected and projected by the Standard Oil Company at five different points on the Pacific Coast are marvellous outputs of the Sperry Gyroscope Company's laboratories. These big light projectors are each fitted with two 500-watt special incandescent lamps, but only one of these is in action when the beacon is functioning. And here comes in the particularly prominent features of the machines. In order to get the tremendous increase of illuminating power possible through mirrors and prisms, it is necessary that the lamp in service be in a mathematically exact focus. Obviously, too, it would be practically impossible to have an attendant at the light all the time,

and lamps will burn out and fail. But the two lamps in each unit are so arranged that should one fail, it releases a relay, and the fresh lamp slides into exact focus, the burnt out one moving back and the rays steadily pierce the night without appreciable break.

And now comes another wonderful feature. At the moment of failure of one of the lamps, an alarm is given to the Standard Oil Company's nearest station informing the attendant that one of the lamps has gone and that another reserve one should be immediately installed to be in readiness for any other trouble. This will insure against any interruption of service and will make the big light automatically continuous. For, in addition to the

features already described, the beacons are so equipped that should the main supply current fail, an alarm is given and an extra circuit is cut in automatically.

As the lighting and extinguishing of the beacons is controlled by an astronomical clock, which switches the lamps into action at sunset and "douses the glim" at sunrise, taking care of all changes of time, it would appear a most admirable way of lighting desolate places. Two separate electric lines could be so arranged that failure would be a very remote possibility.

One of these Sperry beacons, established on Mt. Diablo by Standard Oil Company, has recently given proof that it is useful for seafarers as well as sky fliers. The captain and officers of the steamer President Lincoln picked up the light of this beacon eighty-four miles off the California Coast, the six-second flashes being easily observed. This sight served to check up on position of the vessel, and was a distinct aid inasmuch as a verification of other observations and results was arrived at, giving added confidence and security to passengers, cargo and ship.

Instruction in the Use of Gyro

THE classes established by the Sperry Gyroscope Company in the Matson Building, San Francisco, are still well attended by marine officers who desire to thoroughly understand the practical and technical operation of gyroscopic machines. J. F. McConkey, who is West Coast representative of the Sperry Company, gives his personal attention to these classes, assisted by experts. A complete, full-sized gyro compass in operation is one of the features, together with a "cut-away" model, which gives a most clear understanding of the interiors. A large globe, with gyroscopes of small size, but workable, illustrates the action of this peculiar instrument, and shows how it always aligns itself with the true axis of a moving sphere.

The attendance to these classes is averaging about twenty officers per week, all of whom appear to be most intensely interested in the instruction given. It may be worthy of note that the Sperry company maintains this school as a "service" unit, and no charge is made to the students.

De Laval on Shipboard

THE De Laval oil purifiers on the diesel-powered dredge Clackamas, owned and operated by the Port of Portland (Oregon), have been in continuous operation for twelve hours a day since 1925, with a repair bill of only 25 cents for that time, as reported by the man in charge. This remarkable record shows the care with which these units are designed and built. This record is all the more remarkable when one considers that the purifiers are installed near the main power plant, and subjected to considerable vibration.

Among recent installations of De Laval oil purifiers made on the Pacific Coast are three Type 302 purifiers for the Matson Navigation Company, one each on the recently purchased steamers Manini, Makawalo, and Makua. Two Type 202 purifiers were installed on the motor fishing vessels Chas. Bower

and Apex, operated by the Antorg Trading Company of Seattle. A Type 202 was supplied to the Foss Launch & Tugboat Company, Tacoma, for one of its diesel engine vessels; and a purifier of the same type was furnished to P. F. Harris Co., Seattle, for its workboat Seakist.

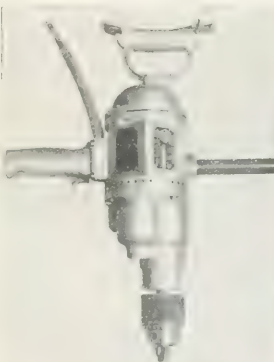
The Dollar Steamship Company's liner President Pierce has had a Type 302 purifier placed in her engine room, as also has had the U.S. Bureau of Fisheries motor vessel Elder. Swayne & Hoyt, Inc., of San Francisco, ordered a Type 302 for their steamer Point Gorda; and the Puget Sound Navigation Company, Seattle, has had a Type 302 placed on its new diesel-powered ferryboat Bainbridge.

This group of purifiers will save and recondition a vast amount of oil which otherwise would go to waste.

desirable for workboats and small yachts.

C. J. Hendry Company, ship chandler with stores in San Francisco, San Pedro, and San Diego, has recently been appointed sole California distributor for Shipmate ranges.

New Electric Drill



A Well Cooked Meal is a Strong Appeal

THOSE who follow the sea are much like their fellows ashore as regards good "eats." From the commodore of the yacht club or the senior officer of a liner down to the man who tends the oil burners, shovels coal, or cleans decks, a well cooked meal is a strong appeal. And to insure this meal being well and properly cooked a good range or stove is necessary.

For nearly a half-century, the Stamford Foundry Company of Stamford, Connecticut, has been manufacturing Shipmate ranges and stoves for seafaring folks. Thousands of them are in commission today under the care of competent cooks who turn out tasty meals, and the Shipmate never fails in its part of the work.

Made of the best materials, a special grade of stove iron being used, these units never wear out and seldom need any repairs beyond new firebrick linings. In fact, an old cook was heard to say recently that he had handled one of the old-time Shipmates on a coaster to Alaska for twenty years and it was good for as many years more.

In spite of these records of success with coal and wood, the maker of Shipmate ranges has kept pace with modern ideas and has recently put on the marine market a new gas range in sizes from a tiny two-

burner unit only 5 by 13 by 21 inches, weighing 25 pounds, up to a large unit fitted to burn either coal or gas and with an unusually large oven capacity. The weight of this latter unit is 445 pounds and it is in every way large enough to cook the food of a crew of forty men. A special feature of these new gas-fired stoves and ranges for sea use is the fact that the fuel is stored in steel cylinders in liquid form and becomes a low pressure gas only after leaving the cylinders.

By this arrangement, all danger from fire or explosion is obviated, and the starting of a fire in the galley stove is as simple as lighting a gas range in the home kitchen ashore. There is no preheating or priming of the fuel. Light a match, open the gas valve, and ignite the burner. That's all.

These gas holding cylinders can be purchased in many ports at prices comparable with other fuels and at the same time doing away with dirt, ashes, and danger. Besides these advantages, the galleys are very much cooler, a factor of much value in small craft where the galley is often close to the living quarters. The gas used is non-poisonous and the storage cylinders can be tucked away in any convenient place as far from the galley as desired. This feature in itself should make the new arrangement

THE new 3/4-inch heavy duty portable electric drill, which Black & Decker Mfg. Co. have recently put on the market, has been designed to meet the constantly growing need for a powerful drill of 3/4 inch capacity to take straight shank drill bits.

This drill is equipped with an exceptionally powerful universal motor, operating on direct or alternating current, and the armature and spindle thrust are mounted on ball bearings.

The 3-jaw geared chuck uses straight shank bits, and the drill will readily drill holes up to 3/4 inch in diameter in the toughest steel. Such a tool is needed especially in mass production work, where constant service is essential. Manufacturers of marine engines, ship builders, and ship repair crews will find it ideally adapted to their severe work.

TRAWLER BOSTON CORRECTION

The Caption under a picture of the trawler Boston, which appeared on Page 371 of this issue should read:

Trawler Boston being converted to diesel drive at the outfitting wharf of the New London Ship & Engine Company.

Noncorrosive Steel

A New Material For Propellers

PROPELLERS of moderate size and upward are usually made of either cast iron, semi-steel, cast steel, or manganese bronze. Each presents its individual appeal to the designer or owner, and the selection is usually the result of weighing certain advantageous characteristics against certain disadvantages. The recent successful use of an alloy steel, with rustless, noncorrosive properties, has added this material to the group from which a choice can be made.

After observations that cover two years time, it appears to be demonstrated that this alloy possesses the advantages anticipated and predicted. Solid propellers have been cast of this steel up to about seventy-five hundred pounds in weight; individual blades have also been cast and installed up to corresponding sizes.

It may be of interest at this time to consider the characteristics of the several materials.

Of all the available materials, cast iron is the cheapest in first cost. It permits of easy machining and balancing. Its very lack of strength compared to the steels and its readiness to fracture rather than bend are not to be counted against it too strongly. Sufficient strength is obtained by using correspondingly thick sections, resulting in a propeller that is relatively heavy. Desirable contours and shapes become the subject of compromise, and over-all efficiency is somewhat affected. Machining presents no difficulties; and the foundry is so familiar with the action of cast iron as to be relieved of any surprises due to warping. When a cast iron propeller blade hits a foreign object in the water with sufficient force, either the object breaks and is thrown clear, or the blade breaks and drops off. There is no bending of the blade with possible fouling of itself in the propeller well, nor is there any loss in propeller efficiency due to



A closeup of one of the "Calmar" rustless steel propellers on the Standard Oil tanker H. T. Harper after more than a year of service.

carrying a distorted blade following such a casualty. The propeller is unbalanced, of course; and, if it be four-bladed, the opposite blade should be cut off as soon as possible, thus greatly relieving the unbalanced condition.

Corrosion of the cast iron propeller is a great drawback to its use. Also, its lack of strength and its brittleness demand blade thicknesses from forty to fifty per cent in excess of those required for bronze or steel. But it is really the shortness of the efficient life of the cast iron propeller due to corrosion that constitutes its worst feature. In this respect, however, it shows up better than cast steel. Cast iron hubs outlast the cast steel blades that are sometimes used in combination.

Cast steel offers increased strength—both elastic limit and ultimate—as compared with cast iron. This means that stresses in a cast steel propeller can be kept within safe limits using thinner sections, thus improving the efficiency of the wheel. Approximately, a cast steel propeller weighs 20 per cent less than a cast iron propeller of the same characteristics. It is interesting to note that a cast

steel propeller of standard blade design weighs practically the same as does a corresponding manganese bronze propeller. This is due to the fact that, although the thickness of the cast steel propeller is greater than that of bronze, manganese bronze weighs more per cubic inch than does cast steel. One item just about offsets the other.

But when the matter of corrosion is considered, cast steel leads the list of sufferers. The average life of a cast steel propeller blade is two and one-half years. The surfaces have become so pitted and rough as to affect materially the efficiency and the strength of the propeller blades.

Manganese bronze offers some relief from corrosion troubles of the propeller. In passing, it may be said that the name "manganese bronze" is technically and strictly speaking, a misnomer. Its major constituents are copper and zinc, and as such it should be classified under the "brasses" and not the "bronzes." Manganese, in the alloy used by the United States Navy for propellers, is limited to 3.5 per cent, and is used primarily for a deoxidizing agent. Copper percentage in manganese bronze varies between 55 and 62; zinc between 38 and 42; small percentages of tin, aluminum, iron, and lead are permitted. The minimum tensile strength under Navy specifications is 65,000 pounds per square inch; and elongation in 2 inches must be at least 20 per cent. On account of its strength, ductility, and partial resistance to the action of salt water, it has been extensively used as a propeller material. It can be readily and accurately machined, it will take a lustrous polish. Balancing is quickly effected. However, there are cases where the zinc in the alloy apparently has re-assumed its entity and proceeded to waste away, leaving small pits throughout the surfaces of the propeller—"de-zincifying," if you please. Also the edges of the blades get rough and blunt.

In the present discussion, the terms "corrosion" and "erosion" are conveniently considered under the single term "corrosion"; by this is meant the wasting away and pitting of the material, regardless

of the causes. The effect of corrosion is obvious; the cause or causes are not.

This corrosion is not confined to cast iron, semi-steel, and steel blades; it is also encountered in the manganese bronze blades. Among possible causes of bronze blade corrosion that have been investigated are cavitation, the effect of water at high velocity striking the blade surfaces, the nature of the surfaces of the blade metal, and the stresses to which the material is subjected. The British Admiralty recently sponsored a series of experiments along these lines, extending over a period of eighteen months. It was found that machining or grinding the blade surfaces was slightly beneficial. However, inasmuch as this is the usual operation when a bronze propeller is being made, this result was not particularly valuable. Manganese bronze test bars were subjected in salt water to certain tests during which the material was stressed steadily, this stress being below the elastic limit; similarly other bars were stressed, under test, beyond the elastic limit; and finally, alternating stresses were applied to other bars. The general results were disappointing in that they were uniformly negative in character, showing that none of the causes under investigation could account for the condition frequently found in bronze propeller blades in service. Tests simulating the service condition of propellers under cavitation action also failed to show results that could be seriously considered as materially contributing to the condition found on blades in service.

In the average merchant vessel there are frequent periods when a portion of the propeller operates out of water. This exposure to the air increases the corrosive action on the blades, pitting their surfaces and blunting their edges.

It has been recorded that bronze blades tend to twist themselves in service, thus coarsening their pitch. To counteract this, although not required by the American Bureau of Shipping, the thickness of the bronze blade is sometimes made equal to that required for the cast steel blades.

Therefore, if the propeller itself were the only consideration, manganese bronze would appear to be the preferred propeller material. Unfortunately the use of manganese bronze removes some of the

trouble from the propeller and transfers it to the hull, in the case of steel hull vessels. Electrolytic action between the bronze of the propeller and the steel of the hull begins as soon as the vessel takes the water and continues throughout its life afloat. The pitting of hull plates is a more serious proposition than pitting of a propeller, and the accepted means of retarding and arresting this electrolytic action—for such it is—is the generous use of zinc slabs in metallic contact with the steel plates in the vicinity of the stern. The properties of the three metals—copper, zinc, and steel—are such that the zinc will become the opposite (and wasting) pole to the copper (of the bronze alloy) leaving the steel of the hull unaffected; and until the zinc slabs are eaten away, or coated with an insulating oxide, the hull will remain practically immune to electrolytic action; provided, of course, zincs in sufficient number and of sufficient area have been properly located in metallic contact with the steel that they are to protect. These zincs must be renewed from time to time while the vessel is in dry dock.

The normal docking period of a vessel varies. It depends upon her present service, her anticipated service, the condition of her bottom as regards cleanliness, and the condition of her zinc slab protection. For vessels remaining on certain fixed routes, with drydocks near at hand and without fear of diversion—such as the bay ferryboats—the time between dry-docking can be flexible. One ferry company with steel vessels docks its boats when the fuel consumption per ton-mile reaches an excess of about 20 per cent above that which is consumed when the bottom is clean. Experiments in service with bottom paints have been made in order to determine what paint will most prolong the docking period. Already it has been demonstrated that the clean-zinc protectors which are fitted on the boats that have bronze propellers. Any action tending to lengthen the docking period without causing extra costs in other directions is of benefit to the owner.

What then is the correct economic solution of the propeller material problem in a steel vessel? On the one hand we group bronze propellers with zinc slabs, zinc slab

wear, then dry-dock in order to avoid hull corrosion; ferrous propellers, with blunt edges and rough surfaces and short life.

The answer seems to lie in the use of a noncorrosive steel alloy, in which is found a material that will not itself corrode nor be a party to corrosion in other portions of the vessel. Fully as strong as cast steel, it has been rapidly making a bid for favorable consideration on the Pacific Coast.

Its physical characteristics vary with heat treatment, but are in excess of those demanded for cast steel by the American Bureau; and, as stated above, the condition of a propeller after two years continuous service has shown its ability to withstand corrosion. Unlike the commonly known "stainless steel" of high chromium content, this material has other alloys so compounded as to make it extremely ductile as well as corrosive and abrasive resistant. Surfaces, when machined, take a mirror-like polish. The use of the electric furnace with its great flexibility, high temperature and accurate temperature control permits of making sound, clean, dense, homogenous castings of the desired chemical analysis.

Like all other propeller metals poured in sand molds, this material, as cast, has the usual surface imperfections which must be ground off. Due to its toughness, the cost of machining is higher than the cost of machining a cast steel propeller. The machining of blade surfaces has not been considered necessary in the case of the large size propellers which have been made up to this time; machining has been confined to boring, facing, and key seating, blade surfaces are made sufficiently smooth by careful grinding.

Test bars from finished castings of these alloy steel propellers manufactured on the West Coast and now in service showed an average tensile strength of over 73,000 pounds per square inch. The percentage of elongation in a 2 inch bar was over 54 per cent.

The American Bureau of Shipping, in its 1927 issue of "Rules for Building and Classifying Steel Vessels," does not include a stainless steel value for constant "C" in its formula for blade thickness. Cast iron, semi-steel, cast steel, and bronze are the only materials mentioned. The Bureau is, however, doubtless prepared to consider the additional strength of stainless

steel and to designate the value of "C" to be used in connection with designs calling for this material. Obviously, the use of the constant "C," as given for cast steel, provides an increased margin of strength, if used in a stainless steel design.

The following shows the relative tensile strength of the five materials—cast iron, semi-steel, manganese bronze, and anti-corrosive steel. Also there is shown the relative blade thicknesses suitable for the respective materials.

Due to the ductility of stainless steel, variations in pitch that occur during the cooling of the propeller casting can be easily rectified by

	Tensile, lbs. per square inches	Percent Relative Age Blade Elong Thick- ness
Cast Iron	20000-25000	none 171
Semi Steel	25000-30000	none 149
Cast Steel	70000-75000	20-30 120
Manganese Bronze	65000-70000	20-25 110
Anti Corrosive Steel	70000-75000	50-60 100

pressing without heating. On solid propellers with pitches of 108 inches and 160 inches respectively, the pitch on four propellers, as rectified, varied less than 1 per cent from the designed figure.

The results so far obtained have been very gratifying and, with the pioneering and experimenting practically completed, the increased use of this material for propellers for steel ships may be confidently expected.

Trade Literature

Ingersoll-Rand Company. 11 Broadway, New York, and with offices in all the leading cities of the world, has recently published a very fine catalog covering Multi-Stage Centrifugal Cameron Pumps.

Cameron pumps are the product of a subsidiary, the A. S. Cameron Steam Pump Works. The catalog covers the application, operation, and construction of these modern, highly efficient pumps, which are designed for modern high pressure boiler feeding, hydraulic service in steel mills and other industrial plants, pipe lines, etc. The catalog is profusely illustrated with 32 half-tones and is bound in an attractively embossed paper cover.

International Nickel Company. 67 Wall Street, New York, has mailed to the trade the third of its series of four leaflets on Nickel Cast Iron. The present circular covers the subject of dependable properties—increased strength—in grey iron castings by the use of the nickel cast iron.

General Electric Company. Schenectady, New York, has available the following catalog-leaflets:

No. GEA-457A; Squirrel-cage induction motors.

No. GEA-994; Travel carriage for automatic arc welders.

No. GEA-869; Magnetic switch for alternating-current motors.

No. GEA-961; Sheath-wire resistor units.

A total of 85 welded structures, including 43 welded buildings, is listed by Professor Frank P. Mc-

Kibben in the July issue of the **General Electric Review**. The list is made up of 8 bridges, 43 buildings, 3 cars, 2 cranes, 6 frames and towers, 12 ships and allied structures and 11 tanks.

Commenting on the list, Professor McKibben says that it "shows that this process is no longer in the experimental stage, but is a means of fabrication so extensively used as to warrant the attention of all structural engineers and architects. Welding has also been widely adopted in joining structural shapes and plates to produce substitutes for large castings—substitutes which are stronger, more reliable and more economical.

MINIATURE BOAT BUILDING. by Albert C. Leitch. 250 pages; profusely illustrated. Published by Norman W. Henley Publishing Co., New York. Price \$3.

Several books have been published on the design and construction of ship models which were of great help to those who desired to build these little craft, either for recreation or profit; but Mr. Leitch is probably the first naval architect to devote a book to the design and construction of miniature boat building. The volume is filled with concise directions and drawings for models of almost any type of small boat, both for sail or power propulsion. That part of the volume covering small power plants is most complete, showing fully how to make boilers and engines from one to four cylinders. Drawings and dimensions are clear, the author having given nearly fifty pages to this matter. As amateur builders

will in most cases be unable to obtain small castings, an announcement gives the address of a builder specializing on fittings, boilers, and engine parts of miniature sizes. Full size drawings of section and body lines are a part of the publication.

Lunkenheimer Valves

THE modern high pressures carried on steam, oil and water valves in marine engine and boiler rooms necessitate a very high standard of product on the part of valve manufacturers. The Lunkenheimer Company has for a great many years made valves especially adapted for marine use and has steadily kept pace with the more exacting requirements of modern steam practice.

One of the modern steamers of the past year is the *Dixie*, operated by the Morgan Line between New York and New Orleans. This vessel is fitted throughout with Lunkenheimer valves, and though her steam pressures are 350 pounds per square inch, with superheat bringing the total steam temperature up to 650 degrees, no trouble has been experienced with her valves. Some small leaks developed through chips of metal lodging on valve seats, but this trouble was easily made right by the regrinding principle, brought to such perfection by the Lunkenheimer engineers.

Old time marine engineers are all familiar with the name Lunkenheimer on good valves. Under the stress of recent increases in pressures and temperatures these experienced men are glad to know that the name Lunkenheimer is still behind this product with strong guarantee.

TRADE NOTE

H. W. French, vice-president of Hill, Hubbell & Company, who for a number of years has been this corporation's representative in the San Francisco Bay district, recently left San Francisco to take up active management of the Atlantic Coast activities of Hill, Hubbell & Company. The Atlantic Coast headquarters of the company are located in New York City and Mr. French intends to make his home there. He will, however, have charge of a large territory reaching as far west as Chicago and south to Baltimore.



Marine Insurance

Edited by JAMES A. QUINBY

"Warehouse to Warehouse" Interpreted Modern Cargo Clause in Court for First Time

IN one of the most significant marine insurance decisions of recent years, Federal Judge Kerrigan of the District Court for the Northern District of California on July 6 handed down an opinion in the case of *Lindo versus Ocean Marine Insurance Company*, holding that an assured under a cargo policy containing the modern warehouse to warehouse clause is entitled to recover from his insurer for a loss by fire in a customs warehouse six days after landing at port of discharge, even though the goods were destined for an inland point other than that named as the destination in the policy.

Counsel involved were Derby, Sharp, Quinby and Tweedt, for the assured, and W. S. Andrews and Bell & Simmons for the Ocean Marine Insurance Company.

A statement of facts is rendered unnecessary by the clearness of Judge Kerrigan's opinion, which follows in full.

"On March 1, 1924, H. M. Newhall & Co. of San Francisco, as agents for respondents, issued to E. Palazzo & Co. of Corinto, Nicaragua, an open marine policy on goods shipped by them to various ports, including Guatemala. Palazzo & Co. had authority to issue certificates of insurance under this policy. During the same month the firm of Schlubach, Sapper & Co. of Guatemala City ordered various shipments of cotton from E. Palazzo & Co., which resulted in the shipment of 45 bales from Corinto on the 24th of the month by the steamship *Eupatoria* and 95 bales on April 3, 1924 by the steamship *San Juan*. These shipments were covered by said policy.

"The *Eupatoria* arrived at San Jose de Guatemala on April 4, but the port being too congested to discharge the 45 bales at the time, she proceeded to Champerico, a distance of about 70 miles, returning to San Jose on April 11, when the 45 bales were discharged and at least 34 of them were placed in the Custom

The Ballad of Barney Moran

Oh stop and consider, as late as you can

The diurnal dilemma of Barney Moran

A widely known ocean insuring man

He could drink and play dominoes. Full well he knew

How to go round the links in a seventy-two

(His secretary wrote his business, that's true).

Our Barney insured against ills of the bay

The galloping gas-eater "Eleanor A"

Belonging to Marmaduke Jasper McKay.

No sooner had Barney collected his fee

Than the gas-boat was sunk by the schooner "Machree"

Owned by Michael Eliphalet Terrence McGee.

The *Machree* was to blame; thus ran the reports—

So Barney acquired a lawyer of sorts

And tackled McGee in various courts.

He paid him a fee for to prosecute

He paid him for costs and expenses to boot.

And at last the case was ready to shoot.

When Barney found out that his secretary

Had insured the liability

Of Michael Eliphalet Terrence McGee.

J A Q

House there. It is contended that the policy was discharged because of the trip to Champerico; but, on reading the certificates of insurance and the open policy together, I am satisfied that this is not the case and that the goods were covered at the time of their landing at San Jose.

"The *San Juan* arrived in San Jose April 10, 1924, and the 95 bales on board were discharged, these also being placed in the Custom House.

"On April 16, 1924, before the removal of the goods from the Custom House by Schlubach, Sapper & Co., the Custom House burned down and the 129 bales so placed therein were destroyed by fire.

"The certificates of insurance recite that they

are issued under the open policy of E. Palazzo & Co. covering the cotton in question. One of the risks insured against was the risk of fire. The certificates also contain the following clause on which the main point in the case turns:

"The insured goods are covered subject to the terms of this policy from the time of leaving the shippers' or manufacturers' warehouse during the ordinary course of transit until on board the vessel, during trans-shipment if any, and from the vessel whilst on quays, wharves, or in sheds during the ordinary course of transit until safely deposited in consignees' or other warehouse at destination named in policy; but in any event risk hereunder to cease within ten days after landing at destination."

"Under the terms of the policies any loss is payable in San Francisco, to Schlubach, Sapper & Co., or order. After the loss of the cotton, Schlubach, Sapper & Co. made proof of loss and endorsed the certificates to libellant, Donald Lindo, and forwarded all documents to him for presentation to H. M. Newhall & Co. This was done, and payment was refused. Suit was then com-

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menced. Respondents urge that the evidence shows that Schlubach, Sapper & Co., and libellant as their assignee, are not entitled to maintain this suit, but examination of the record convinces me to the contrary.

Case Turns Upon Meaning of Clause

"Many points are made, but the most important, and the only one that will be discussed at length in the case, is the meaning and effect of the 'warehouse to warehouse' clause contained both in the open policy issued by respondent Ocean Marine Insurance Co., Ltd. to E. Palazzo & Co. and in the certificates of insurance thereunder issued by the latter to Schlubach, Sapper & Co. This clause is given in full above.

"There is much discussion in the briefs based on the dictionary definition of the word 'warehouse,' and relating to the question whether the Custom House 'bodega' or 'warehouse' at San Jose de Guatemala was of sufficiently sturdy construction to be classified as a 'warehouse' rather than a 'shack' or a 'shed.' I do not doubt that the Custom House at San Jose, while far from being fire-proof, might, so far as its physical character is concerned well be used as and called a 'warehouse.' The real question here, however, is the meaning and effect of the 'warehouse to warehouse' clause and I do not think that it is to be determined by a critical consideration of the meaning of the term 'warehouse' and whether a particular custom house building falls within the definition.

"Both parties agree that the insurance here involved does not cover beyond San Jose de Guatemala nor apply to the contemplated transit from there. Both agree that it was 'transit insurance'; that is, insurance of the goods only while in transit. The respondents, however, contend this to mean that the risk ends whenever transit to the port of destination ends by the goods reaching their final resting place at that port. They argue that the goods were here 'safely deposited in the consignee's or other warehouse named in the policy' and that whether warehouse or shed is really immaterial since the goods had reached their final resting place at the port of destination and were no longer in transit. Respondents say, 'If at the port of destination the goods were unloaded from the vessel to a wharf, a quay, or a shed which is their final resting place they are no longer covered (altho not deposited in 'consignees' or other warehouse)' because they are no longer in transit.'

"Libellant on the other hand contends that the 'warehouse to warehouse' clause was intended to extend the 'transit' during which the goods were insured, that it does not treat the transit as ended upon the mere landing of the goods, but covers them at the port of

destination so long as they are in transit, until they are either safely deposited in 'consignees' or other warehouse' there, or ten days has elapsed since their landing. Libellant argues further that where it is intended to ship the goods inland as soon as practicable and they are held in a custom house to be cleared for less than ten days and for no more than the time reasonably required to release them from the custom authorities, this cannot be regarded as a deposit in 'consignees' or other warehouse' within the meaning of the 'warehouse to warehouse' clause.

"In my opinion the position of libellant is most nearly in accord with the evident purpose of the 'warehouse to warehouse' clause. Until it came into use, marine policies commonly insured goods only until 'discharged and safely landed.' This terminated the risk immediately the goods were landed and unless other insurance was effected left them uninsured from that time until they could be removed from the wharf and warehoused. The new clause was intended to change this. Its obvious purpose was to extend the period of the risk to cover the 'ordinary course of transit' before loading at the port of shipment and after landing at the port of destination 'whilst on quays, wharves or in sheds during the ordinary course of transit until safely deposited in consignees' or other warehouse at destination named in the policy; but in any event risk hereunder to cease within ten days after landing at destination.' This clause might have been more clearly expressed in some respects but its purpose seems fairly plain. When the intended destination of the goods is that named in the policy and they are to be warehoused there the case is simple. It would be conceded in that case that the temporary deposit of the goods by public authorities in a custom house and their retention there for less than ten days, if such period was reasonably necessary to clear them through the custom house, would not terminate the risk. The goods would be regarded as still in transit. The holding in the custom house would not be deemed the safe deposit in the 'consignees' or other warehouse' referred to in the clause and the risk would end only upon such deposit or the earlier expiration of a period of ten days after landing.

Goods In Customs Still In Transit

"In a case where the intended destination of the goods is not the destination named in the policy, and the consignee does not intend to warehouse them there at all, but intends that they shall be reshipped as soon as practicable, I cannot believe that the operation of the clause is so far affected that the action of the public authorities in taking the goods to a custom house accomplishes the safe deposit in the consignees' or

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other warehouse referred to therein. In my opinion the goods are not in such a case 'warehoused' within the meaning of the policy and the risk continues until either the expiration of ten days after landing or until the consignee has in some way within that period definitely warehoused, shipped, or otherwise appropriated the goods at the destination named in the policy.

"The construction of the clause contended for by respondents would mean that if a consignee intended to warehouse the goods at the destination named in the policy the risk would continue until he did so, or ten days expired after their landing. But if the consignee did not intend to warehouse them there, but to transport them further, the risk would cease the moment they were landed at such intermediate point. With this view I cannot agree.

"Toward the end of the case, if not earlier, it was learned that the open policy issued to Palazzo & Co. ran only from the Ocean Marine Insurance Co. Ltd., whereupon libellant discontinued the suit against respondent North British & Mercantile Insurance Co., Ltd. The latter company therefore should have its decree, with costs.

"The amount of damages suffered, if libellant is entitled to recover is not, it appears, disputed. Therefore judgment will be ordered entered for libellant in the sum of \$18,220 with interest from April 16, 1924, and costs, and in favor of respondent North British & Mercantile Insurance Co., Ltd., against libellant for its costs."

Rusty Hinges on Golden Gate

ALMOST six years have passed since that foggy afternoon when the Lyman Stewart and the Walter A. Luckenbach crashed in the Golden Gate, and the bleaching bones of the Stewart still signal a mute warning to the passing mariner. A few hundred yards to the eastward, in a cove under the shadow of the California Palace of the Legion of Honor, the Coos Bay rears her battered hulk, a monument to disaster at the portals of San Francisco.

The Golden Gate is in danger of being classed with the famed Sargasso Sea as a graveyard of ships. The visitor to the city is shown the finest harbor in the world, with its miles of docks and shipping, but he can hardly overlook the gravestones he is forced to pass at the very entrance to that harbor. Even the casual observer must admit that the beauty of nature would be more striking if unadorned by the skeletons of these notorious wrecks. But, as Mark Twain said

of the weather, "Nobody seems to do anything about it."

The layman might well puzzle over this failure to take action. As a matter of fact, the wrecks are very much in the same class as the weather, as far as any personal duty of removal is concerned.

There are three possible agencies which might be expected to have a legal duty to remove wrecks. These are the City of San Francisco (near whose land the wreckage lies), the vessel owners, and the federal government, which is charged with jurisdiction over navigable waterways.

The city, at least as a corporate entity, is out of the picture, since both wrecks are below the high water mark, and consequently out of its limits.

The vessel owners, or their successors in interest, are legally liable for removal only if some federal statute requires such removal. To determine the absence of legal liability in this connection, we must examine the various federal measures touching upon the subject.

Section 409 of Title 33 (Navigation and Navigable Waters), Code of Laws of the United States of America, provides in part as follows:

"And whenever a vessel, raft, or other craft is wrecked or sunk in a navigable channel, accidentally or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night, and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of the said owner so to do shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same, and prosecute such removal diligently, and failure to do so shall be considered as an abandonment of such craft, and subject the same to removal by the United States as hereinafter provided for."

A subsequent section (Sec. 414), provides that "Whenever the navigation of any river, lake, harbor, sound, bay, canal, or other navigable waters of the United States shall be obstructed or endangered by any sunken vessel, boat, water-craft, raft, or other similar obstruction, and such obstruction has existed for a longer period than thirty days, or whenever the abandonment of such obstruction can be legally established in a less space of time, the sunken vessel, boat, watercraft, raft or other obstruction shall be subject to be broken up, removed, sold, or otherwise disposed of by the Secretary of War at his discretion, without liability for any damage to the owners of same. . . ."

From these sections, it is apparent that neither the

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BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Limitation Denied

"Excerpts from the scenario are illustrative of other scenes depicted in the progress of the picture. The continuity and the sequence are complete, one thrill after another. May it be successfully contended that the limitation statute can extend to a vessel transformed from a marine commerce craft to a scene, or structure, on which a spectacle or play was to be exhibited, a stage with its adjuncts and decorations on which acting was to be done, to produce thrills in a moving picture by blasting dynamite to destroy parts of the ship, as being within the purposes 'it is intended to subserve and the reasons on which it rests'? The ship was like a three-legged stool, useful only for thrills in the dramatic service. Take one leg from a stool and part of a stool is left; take one-third of the ribs from a vessel and cut the bulwarks, and we have only part of a vessel left. A three-legged stool, by careful handling, could stand, and a vessel deprived of one-third of its ribs and bulwark cut, by careful handling, could float, and in that sense the vessel might be within the letter of the law, but that does not bring it within the spirit of the limitation statute.

"But whether within the intent and purpose of the limitation act, the vessel was not seaworthy and maintained in a seaworthy condition. And this obligation rested upon the owner to see that the vessel was in all respects seaworthy.

"Seaworthiness means efficiency of the vessel in materials, construction, equipment, officers, men, and outfit for the trade in which it is employed. The ship had been seaworthy, but its strength was lessened by removal of one-third of her ribs and cutting the bulwarks, and building false exterior hull and deck, and lengthening the masts, necessitating careful handling. It had no motive power, and if it was seaworthy at the time it was towed from Long Beach to Catalina Island, all sails set at the Island, it became unseaworthy prior to the injuries and death when the top of the mizzen mast was shot off and fell."

Limitation of liability was accordingly denied.



vessel owners nor the Secretary of War is under any duty to remove the Coos Bay or the Lyman Stewart, as both vessels are decidedly out of the navigable channel. In fact, a series of jagged rocks would have to be negotiated before traffic could reach the wrecks from the seaward side.

There is apparently a gap, or legal hiatus, in the supposedly continuous chain of liability for wreck removal, and the only hope for action lies in a concerted effort by the people of San Francisco. The Junior Chamber of Commerce of San Francisco has recently appointed an investigating committee, who have been assisted by Captain Pond, of the United States District Engineers, and by Colonel Bell, of the Army Engineers. The general recommendation of this body seems to be that the wrecks will have to be cut down to water level by the use of acetylene torches. It might be feasible to raise the money for this work by popular subscription, or by an appeal to Congress for a special appropriation.

Not in the Picture

ARDENT movie fans who saw the film "Old Ironsides" probably failed to realize the element of realism involved in the mimic sea battles glimmering before their eyes. Men raced madly up the shrouds of the gallant frigate, their forms obscured by clouds of smoke—enemy guns flashed viciously, and luckless sailors hurtled lifeless to the deck below. Only recently has it been generally known that some of the hurtling figures were not dummies, but flesh and blood.

Dependents of the dead and injured actors brought suit against the producers of the picture, who promptly filed a petition to limit liability to the value of the Llewellyn J. Morse, an old sailing ship which had been altered to impersonate the Constitution. (Old Ironsides-Llewellyn J. Morse—1928 AMC 854.)

When a Ship is a "Prop"

"The petition and the evidence," says Judge Neterer, in his opinion,

"show that the Llewellyn J. Morse was built in 1877, a full rigged ship of 71 tons net register, with length of 198.2 feet, breadth of 36.6 feet, and a depth of 24.2 feet, and was purchased and thereafter transformed into a 'prop' (said to be 'anything that goes to decorate a set'), a replica of the ship Constitution, nicknamed Old Ironsides, by building a 'false exterior hull, false decks, removal of the old masts, and the installation of three high masts and a long beam;' that the bulwarks and approximately one-third of the ribs of the ship were cut out to put in gun ports 'rendering it unfit for commercial purposes,' and 'necessitated that the vessel be handled carefully.' After the ship was transformed into a 'prop' actors were hired to act in a picture; some of these had training as seamen. The ship had no motive power, but was full rigged and was towed by a tug to a point on the ocean off Catalina Island, California. It moved along the island with sails set. There the scenes were taken representing a battle between other vessels and the Constitution and a fort on land.

"Dynamite was put in the main mast, mizzen mast and fore mast about 30 or 40 feet from the tops of the masts. The masts were 140 to 150 feet high. In the scenes shots from the vessels and from the fort were fired, and shots were supposed to hit the tops of the masts on the Constitution and break them off. In reality, blank shots were to be fired, and simultaneously explosives which had been placed in holes drilled in the mizzen mast of the ship in appropriate manner were exploded, causing the top of the mizzen mast to break at that point and fall. About an hour thereafter, the men were directed to go into the rigging of the ship and upon order from Cruse, in charge of the picture, blank shots were fired, and simultaneously the explosives which had been placed in holes drilled in the main and fore masts in appropriate fashion, were exploded, causing the tops of the masts to break at that point while the men were in the rigging, and injury and death followed.

[illegible]

• R.

Recent Shipbuilding Orders

The Spear Engineers, Inc., Portsmouth, Virginia, have received a contract from the Portsmouth City Council and Norfolk County Board of Supervisors for a diesel-electric automobile and passenger ferryboat to ply between Portsmouth and Norfolk. The boat will be 178 feet over-all, 146 feet between perpendiculars, 57 over-all beam; 14 feet molded depth. Power will be supplied by two 400-horsepower Bessemer diesel engines connected to General Electric motors. The boat was designed by Eads Johnson, 115 Broadway, New York, and will cost \$234,000.

Feet long, 17 feet beam, 14 feet depth, 14 miles loaded speed; 250 indicated horsepower diesel engine. This yard also has an order from C. A. Carrell, Bay City, for a wood yacht 90 feet long to be powered with a 200 horsepower diesel engine.

Consolidated Shipbuilding Corp., Morris Heights, N.Y., has an order for a 55-foot tugboat for Gen. R. Elder Jr.; a 106-foot cruiser for L. M. Wainwright; both to be powered with Speedway engines.

Nashville Bridge Co., Nashville, Tenn., is building another pedestrian bridge for the state.

Spedden Shipbuilding Co., Baltimore, Maryland, has recently received an order from the U.S. Army Engineers, Memphis, for a 125-foot fire and patrol boat to be 55 feet long and powered with a 100 H.P. Standard diesel engine.

Charles Ward Engineering Works, Charleston, West Va., has an order from the U.S. Army Engineers, Memphis, for a 125-foot river snag boat to be steam driven.

News From the Shipyards

Newport News Shipbuilding & Drydock Company, Newport News, Virginia, has been awarded a contract by the International Mercantile Marine Company for a sister ship to the California and Virginia, built by this yard for the Panama Pacific Line. The new liner will be similar to the Virginia and will be powered with General Electric turbo-electric propulsion power. The Virginia is 613 feet 3 inches over-all, 80 feet beam, 52 feet depth.

Harbor Boat Building Company, Terminal Island, San Pedro, California, has been awarded a contract by the United States War Department for diesel powered mine laying craft by the Philippine Islands. The boat will be 74 feet over-all, 17 feet molded beam, 6 feet loaded draft, and will be powered with a 6-cylinder, 120 horsepower Union diesel engine, and will cost \$35,000.

Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass., has an order from the Massachusetts Trawling Co. for two steel hulls and from R. O'Brien & Co. for one steel hull.

Dravo Contracting Co., Pittsburgh, Penn., has an order from Merritt, Chapman & Scott Corp. for a steel hull derrick barge 116 by 43 by 12 ft.; an order from the Keystone Sand and Supply Co. for four steel barges 135 by 27 by 6 ft.; and from the U.S. Army Engineers, Memphis, for two steel tug barges 84 feet long.

Defoe Boat & Motor Works, Bay City, Mich., has an order for a custom yacht for unnamed owner, to be 30 feet

Bethlehem's Enlarged Facilities in the Port of Boston

Bethlehem Shipbuilding Corporation, Ltd., has just sent out an announcement of the addition of the Atlantic Works to its facilities in the Port of Boston, greatly enlarging its capacity for marine repairs and miscellaneous machine and boiler work. The new Bethlehem plant is located a short distance north of its Simpson Dry Dock Plant in East Boston on the main ship channel.

The Bethlehem yards in East Boston will in the future be designated as the Boston Plant—Simpson Works and Atlantic Works. These two yards provide the following dry-docks:

Three floating drydocks of 10,000, 15,000, and 20,000 tons lifting capacity; graving docks of 463, 256, and 164 feet length; and three marine rail-slides of 1200 tons and 600 tons capacity, and three hoist cranes.

With the new yards it has increased the full capacity of the plants.

The shops at these yards are complete, including machine shops, engine and boiler shops, and shops for marine and miscellaneous machine and boiler work. The equipment includes the Wheeler oil tank cleaning system, installed in the company's barge Marion, also portable and floating air compressor and welding sets, with ample transportation facilities for the material and labor.

Bethlehem offers in Boston Harbor unexcelled ship repair facilities and prompt efficient service.

First Steel Fishing Boat Launched at San Pedro

The Orient, first all-steel fishing boat built at San Pedro, was launched by the Los Angeles Shipbuilding & Drydock Co., Long Beach. The boat is 110 feet long and is powered



Above is a picture of the new diesel ferryboat Bainbridge leaving the plant of the Dow Washington Shipyard, Houghton, Washington. The boat is 140 feet long, 57 feet beam, and is powered with an 800 horsepower Washington-Exxon diesel engine.

A complete description of the boat and her equipment will appear in the September issue.

with a 350-horsepower directly reversible Atlas-Imperial diesel engine. She will have a cruising radius of 4000 miles and a loaded speed of 10 knots with 150 tons of fish in her holds. She was built for Souza & Dorozo, San Diego fishermen, and was designed by G. B. Newby of the shipyard staff.

Seattle Plant Launches Diesel Tug

A new addition to the Portland tugboat fleet will be the twin screw diesel tug Chahunta, which was launched June 22 by the Winslow Marine Railway & Shipbuilding Co., Eagle Harbor, Washington. The tug is 79 feet 6 inches long, 21 feet 6 inches beam, and 7 feet 3 inches draft. She is of heavy timber construction and was built for the Lincoln County Logging Company of Portland. Her power plant consists of two 200-horsepower, 6-cylinder, directly reversible, diesel engines. Towing machinery, anchor windlass, and pneumatic air steering gear and whistle were furnished by Allan Cunningham of Seattle.

Wilder May Acquire Shipyards To Construct Fast Liners

At a special meeting of the directors of the American Brown Boveri Electric Corporation, June 25, approval was given to the proposal of Laurence R. Wilder to purchase for cash the shipbuilding facilities of the company's Camden plant. Mr. Wilder already has an option on Cramp's shipyard at Philadelphia.

It has been indicated by Mr. Wilder and his associates that they plan to submit bids to the Shipping Board for the purchase of the United States Lines, and if successful, will proceed with plans for the construction of the 34-knot liners which are projected for the Transoceanic Corporation—or Blue Ribbon Line—a four-day service from New York to Europe. The Shipping Board has already disapproved of these plans; but Mr. Wilder has submitted them to Navy Department engineers, who are now studying them to determine their availability for use as auxiliary cruisers in time of emergency.

If plans are approved by the Navy Department, it is estimated that the total construction loan requested from the Shipping Board will be in the neighborhood of \$150,000,000. Mr. Wilder has announced that he plans to use the two shipyards for the construction of these new vessels. It is reported that W.

F. Kenny, New York contractor, is now associated with Mr. Wilder in seeking to obtain the United States Lines.

Shipping Board to Conduct Hull Tests with Models

Model tests of self-propelled miniatures of vessels of the "Doullut-Williams" type hull, will be undertaken by the United States Shipping Board in cooperation with the Department of the Navy, under a plan recently approved by the Board.

The tests, to be held at the model basin in the Washington, D.C., Navy Yard, are preliminary to the proposal to convert to diesel propulsion a number of vessels now in the possession of the Board. The models will be made by the Navy.

The full text of a statement by the Board follows:

Self-propelled model tests with models fashioned after vessels which it is proposed to convert to diesel propulsion will be undertaken by the Shipping Board in cooperation with the Navy Department following action of the Board on June 19. The tests will be designed to ascertain possible increases in speed of ships through alterations in design as well as through substitution of diesel engines for their present steam engines.

Sale of Three Lines of Ships Authorized to Private Firms

Three shipping lines now operated by the Government are to be sold to private operators, in accordance with the terms of the Merchant Marine Act, under instructions given the Merchant Fleet Corporation by the Shipping Board and announced.

The Board directed the Fleet Corporation to prepare specifications and advertisements for bids for the sale of the United States Lines and the five - combination - passenger cargo vessels of the American Merchant Lines, under one resolution adopted.

An Electric Yacht

The first application of turbine-electric propulsion to a pleasure yacht will be exemplified in a 263-foot craft for George F. Baker, Jr., keel for which was laid July 3 by the Newport News Shipbuilding and Drydock Company. This yacht will be of the twin-screw type, designed by Theodore D. Wells, naval architect of New York, and equipped electrically by the General Electric Company.

A total of 2600 shaft horsepower will be used to drive the boat. Each propeller will be driven by a direct-connected induction motor rated 1300 shaft horsepower at 168 r.p.m. Power for these motors will be supplied by two turbine generators.

All the machinery will be installed amidships. The auxiliaries at sea will be driven by power furnished from a three-unit, 150-kilowatt motor-generator set consisting of a standard two-unit induction motor-generator set and a small turbine. Under ordinary operating conditions the generator will be driven by the motor with power supplied from the main propulsion generating unit but, when the main unit is running so slowly that suitable voltage will not be provided, the small turbine, direct-connected to the set, will be put in operation to provide auxiliary power.

A standby auxiliary generator set will also be installed, rated 150 kilowatts and driven by a direct-connected steam turbine. This will be used principally when the main unit is shut down.

The main propulsion motors and generators are all to be equipped with air coolers which will provide a self-contained air cooling system, thus keeping the equipment cleaner and reducing noise. The main propeller thrust bearings will be of the General Electric spring type as installed on the four turbine-electric coast guard cutters and the diesel-electric coast guard cutter Northland.

Standard engine room control will be used with a telegraph system to the pilot house. The control will be so arranged that either or both motors may be driven from either or both generators.

REPAIRS

Low bid was submitted by the U.S. Navy Yard, Bremerton, Wash., for converting the lighthouse tender Manzanita from a coal to an oil burner. The Navy Yard bid, submitted on July 2, was \$21,983. Next lowest bid was submitted by the Albina Marine Iron Works, Portland, \$23,358. Other bids from Pacific Coast yards ranged from \$24,000 to \$35,000. Robert Warrack, superintendent of the 17th lighthouse district at Portland, is in charge of the work.

Albina Marine Iron Works, Portland, was recently awarded job of overhauling the Columbia River lightship on a low bid of \$4090.

This yard has also received con-

tract for \$10,394 for repairs to the steamer West Niger from the Shipping Board. The vessel has been sold to the States Steamship Line.

Bethlehem Shipbuilding Corp., Ltd., Union Plant, San Pedro Works, received contract for new stern frame for the Finkbine-Guild steamer Manhattan Island on a bid of \$48,250 and 38 days.

DELIVERIES

Bainbridge, motor ferry for Kitsap County Transportation Co. by Lake Washington Shipyards, June 21.

Three barges for Union Barge Line by American Bridge Co.; 12 barges to Mississippi River Comm., all during June.

Carfloat to Reading Co. by American Brown Boveri Electric Corp., June 25.

New Bedford, steel passenger and freight steamer to New England Steamship Co. by Bethlehem Shipbuilding Corp., Fore River Plant, May 5.

Grathea II., yacht to E. T. Strong, Flint, Mich., by Defoe Boat & Motor Works, Apr. 1; Luanco, steel yacht to C. F. Hering, Detroit, June 1.

The Straits of Mackinac, auto ferry to State of Michigan by Great Lakes Engineering Works, June 15; flat scow and derrick scow to Great Lakes Dredge & Dock Co., June 20; and July 1.

Steam tug for Fitzsimmons Connell Dredge & Dock Co. by Manitowoc Shipbuilding Corp., June 1.

Hopper barge to Standard Unit Navigation Co. by Nashville Bridge Co., May 13.

Oil barge to Utility Oil Corp. by Sun Shipbuilding Co., June 16.

Alpha, twin screw tunnel towboat for Alpha Sand Co. by Chas. Ward Engineering Works, June 7.

KEEL LAYINGS

Light Cruiser CL-28 for U. S. Navy by U. S. Navy Yard, Bremerton, Wash., July 4.

Wood yacht for C. A. Caryell, Bay City, by Defoe Boat & Motor Works, June 20.

Oil barge for Oil Transfer Corp., New York, by Federal Shipbuilding & Drydock Co., June 4.

Two steamboat hulls for Union Barge Line, Pittsburgh, by Midland Barge Co. during June.

Two deck barges for stock by Nashville Bridge Co., May 24 and 28.

Steel, twin-screw yacht for Geo. F. Baker, Jr., by Newport News Shipbuilding & Dry Dock Co., July 3.

Ferryboat for Dept. of Plant and Structure, City of New York, by Staten Island Shipbuilding Co., July 2.

Three carfloats for the Pennsylvania Railroad by American Brown Boveri Electric Corp., June 12 and 26.

LAUNCHINGS

Martha E. Allen, motor tanker for Lake Tankers Corp. by American Ship Building Co., June 9.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of July 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS
Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U. S. Dept. of Commerce; 133'3" length overall; 10' beam; 12' draft; 1000 H.P. engine; 12 knots; 128 tons; 128 est.

General Electric motors; keel July 1/28 est.
Hull No. 113, lightship, sister to above; keel July 1/28 est.

Hull 114, lightship, sister to above; keel July 1/28 est.

BETHEHEM SHIPBUILDING CORPORATION, LTD.,
UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Three steel dredge hulls for U. S. Smelting, Refining & Mining Co., Oakland, Calif., 100x50x11'4"; 6 cu. ft. buckets.

GENERAL ENGINEERING & DRY DOCK CO.
Alameda, Calif.

Purchasing Agent: Geo. Armes.

Not named, hull 16, fishing boat for A. Paladini, Inc., San Francisco; 78' x 18'6" x 6'6"; 10 loaded speed; 200 H.P. Atlas-Imperial diesel eng.; launch July 7/28 est.; deliver July 20/28 est.

Hulls 17 and 18, mud scows for Board of State Harbor Comm.; 102 x 29 x 9'3"; delivered July 20/28 est.

J. C. JOHNSON'S SHIPYARD
Port Blakely, Wash.

Reed No. 7, hull 152, scow for Reed Mill Co., Shelton, Wash.; 110'x36'x9'11".
Reed No. 8, hull 153, sister to above.

LAKE WASHINGTON SHIPYARDS,
Houghton, Wash.

Purchasing Agent: A. R. Van Sant.

Bainbridge, hull 1, motor ferry for Kitsap County Transportation Co., Seattle; 190' L.B.P. 37' beam; 800 I.H.P. Washington E-stap diesel eng.; launch May 15/28; delivered June 21/28.

THE MOORE DRY DOCK CO.
Oakland, California.

Purchasing Agent: N. Levy.

Two flat wood barges for Raymond Concrete Pile Co., San Francisco; 110'x34'x9'.

Two caissons for Foundation Co., San Francisco; 64' long; 59'6" breadth; 26' high; launched and delivered Apr. 20 and May 1/28.

Memory III., steel yacht for A. E. Fitkin, New York, by Defoe Boat & Motor Works, June 5.

Sea Sails III., for Murray W. Sales, Detroit, by Defoe Boat and Motor Works, June 17.

Towboat for E. T. Slider, by Midland Barge Co., June 13.

General Charles F. Humphrey, ferryboat for Quartermaster Corp. by The Spear Engineers, Inc., June 16.

Towboat for stock by Chas. Ward Engineering Works, June 11; Captain Eric Berdland, towboat for U. S. Army Engineers, Vicksburg, June 28.

U. S. NAVY YARD,

Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 15/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7'.

Six barges for Union Barge Line; 132 x 35' x 6'; 3 delivered.

Ten covered barges for Carnegie Steel Co.; 175x26x11 ft.

Forty-one barges for Mississippi River Commission; 120x30x7 ft.; 15 delivered.

Five sand and gravel barges for Mississippi River Comm., Memphis; 120'x30'x7'; 5 delivered.

AMERICAN BROWN-BOVERI ELECTRIC CORP.,
Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Not named, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hulls 376-377, two carfloats, Reading Company; 250'9" x 34'7"x9' mld.; keels May 2/28; delivered one June 25/28.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 28 est.; deliver Dec. 28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel Sept. 28 est.; deliver Oct. 28 est.

Hull 381, carfloat for Pennsylvania Railroad Co.; keel June 12/28.

Hull 382, same as above; keel June 12/28.

Hull 383, same as above; keel June 26/28.

Hull 384, same as above

Hull 385, same as above

Hull 386, same as above.

THE AMERICAN SHIP BUILDING COMPANY,
Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching.

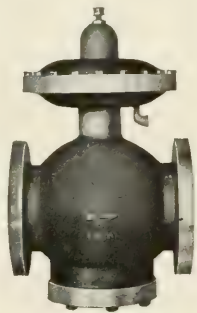
Martha E. Allen, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 ft. beam; 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Work-

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Diesel-electric, Diesel, Fuels
and Lubricating Oils

Holbrook Building, San Francisco
Cables-Radio, "CROZIENGER"

spoor diesel engs.; aux. Scotch boiler; keel
laid 12/27; launched June 9/28; deliver
nAug. 1/28 est.

BATH IRON WORKS

Bath, Maine

Vanda, hull 117, twin screw steel diesel
yacht, 340x36x22', two 1500 B.H.P. Bes-
semer diesel engs.; keel Feb. 3/28.

Don Jorge, hull 118, single screw steel
diesel towboat; 43'x10'; 50-B.H.P. Cummins
diesel eng.

Boston College, hull 119, single screw
steel diesel trawler, two Atlantic & Pacific
Fish Co. Boston; 123'x23'x14'; 400 B.H.P.
Fairbanks-Morse diesel engine; keel June
14/28.

Holy Cross, hull 120, trawler, same as
above; keel June 14/28.

Georgie, hull 121, trawler, same as
above; keel June 14/28.

Paragon, hull 122, twin screw steel
diesel tugboat, 338'x31'x19'; 2 370-
B.H.P. Winton diesel engs.; keel Oct. 15/28
est.; launch Apr. 10/29 est.; deliver May
1/29 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT,

Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast
Guard Service, 250'x42'x15 ft.; Westing-
house; for Detroit & Wind-or Ferry Co.; 156
horse power; and motors 3000 S.H.P.;
launched May 19/28; deliver Aug. /28 est.

No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

New Bedford, steel passenger and freight
steamer for the New England Steamship
Company, Newport, R.I.; 202 L.B.P.; 36
molded beam; 14'6" molded draft; 1082
gross tons, 4 cyl. TE engs.; B. & W. boilers,
coal burning; delivered May/28.

Not named, hull 1418, steel passenger
and freight steamer for the Pennsylvania
Railroad Co., West Philadelphia; 300 ft.
length, TE engs.

COLLINGWOOD SHIPYARDS, LTD.,

Collingwood, Ontario

Hull 82, hopper barge for Dept of Rail-
ways and Canals of Canada; 180 L.B.P. 32
beam; 13 loaded draft; 8 mi. loaded speed;
800 D.W.T., 700 I.H.P. TE engs.; 2 Scotch
boilers, 12'6" diam; keel Mar. 21/28;
launch June 30/28 est.; deliver July 19/28
est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2903, cruiser for New York yachts-
man, 64 ft.; 2-155 H.P. Speedway engs.
Hull 2905, commuter boat for Harrison
Williams; 56 ft. length; 2-650 H.P. Wright
Topham engs.

Hulls 2906-11 inc. 6 play boats for stock.
Hull 2917, 57-ft. cruiser for S. Roth-
child; 2-170 H.P. Speedway engs.

Hull 2919, 57-ft. cruiser for Wm. Ryle;
2-170 H.P. Speedway eng.

Hull 2920, 55-ft. cruiser for Geo. R.
Elder, Jr.; 2 H.P. Speedway engs.

Hull 2921, 106-ft. cruiser for L. M.
Wainwright, Indianapolis; 2 Speedway dies-
els; deliver May/29 est.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Gracelia II, hull 125, yacht for E. T.
Strong, Flint, Mich.; 57'x13'x4'; 13 mi.
loaded speed; 22 D.W.T.; 200 I.H.P. gas
engs.; keel Aug. 1/27; launched and deliv-
ered Apr. 1/23.

Luanco, hull 123, steel yacht, for C. F.
Hering, Detroit; 105 L.B.P.; 17 beam; 6
loaded draft; 13 loaded speed; 110 D.W.T.;
120 I.H.P. diesel eng.; keel July 11/27; de-
livered June 1/28.

Memory III, hull 126, steel yacht for A.
E. Fickin, New York; 141'8" L.B.P.; 32'
beam; 4' draft; 15 mi. speed 350 D.W.T.;
900 I.H.P. diesel engs.; keel Nov. 15/27;
launched June 5/28; deliver July 20/28 est.

See also: Hull 127, wood yacht for
Murray W. Sales, Detroit; 89 L.B.P.; 16'
9" beam; 5' loaded draft; 13 mi. speed; 75
D.W.T.; 160 I.H.P. diesel eng. keel Jan.
12/28; launched June 17/28; deliver July
5/28 est.

Elto, hull 128, wood yacht for T. A.
Yawkey, New York; 56'x11'x3'; 26 mi.
speed 35 D.W.T.; 400 I.H.P. gas engs.;
keel Feb. 15/28 est.; launch Aug. 1/28 est.

See also: Hull 130, wood yacht for C.
A. Caryell, Bay City; 90 L.B.P.; 17 beam;
4 loaded draft; 12 mi. loaded speed; 75
D.W.T.; 200 I.H.P. diesel eng. keel June
20/28; launch Aug. 1/28 est.; deliver Sept.
1/28 est.

Not named, hull 131, steel yacht; owner
not named; 105 L.B.P.; 17 beam; 6 loaded
draft; 14 mi. loaded speed; 110 D.W.T.;
250 H.P. diesel eng.; keel Aug. 1/28 est.;
launch Nov. 1/28 est.; deliver June 1/29
est.

DRAVO CONTRACTING COMPANY,

Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for
stock; 125'26" x 26'6" x 5' 6".

Hulls 675-679 inc.; five steel barges for
Hainesport Mining and Transp. Co.; 130'x
34'x10'

Hulls 691-694 inc. four steel carfloats for
New York Central Railroad Co.; 270'x38
x10'5"; 850 gro. tons ea.

Hulls 702-703, two standard steel barges
for stock; 100'x26'x6'6"; 135 gro. tons ea.

Hull 705, mixer barge for Contract Dept.;
91'x40'x6'3"; 150 gro. tons ea.

Hull 707-708, two steel barges for stock;
100'x26'x6'6"; 135 gro. tons ea.

Hull 711, oil barge for Atlantic, Gulf
& Pacific Co.; 90x30x8 ft.; 195 gro. tons
ea.

Hulls Nos. 712-717 inc., 6 steel sand and
gravel barges for Keystone Sand & Supply
Co.; 135'x27'x8".

Hulls 718-723, 6 standard steel barges
for stock; 130'x30'x7'6"; 250 gro. tons ea.

Hulls 724-733, ten standard steel barges
for stock; 100'x26'x6'6"; 135 gro. tons ea.

Hull 734, steel hull derrick barge for
Merritt, Chapman & Scott, Corp.; 116 x 43
x 12 ft.

Hull 735-38 inc., four steel barges for

WM. CORNFOT, President

GEO. RODGERS, Sec'y-Treas.

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Keystone Sand and Supply Co., 135 x 27 x 8 ft.

Hulls 739-740, two steel snag barges for U. S. Engineers, Memphis, 84 x 24 x 3'6".

Hull 741, oil barge for Atlantic, Gulf & Pacific Co., 80 x 30 x 8 ft.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 103, barge for Oil Transfer Corp., New York; 146'x35'x10'; keel June 4/28; launch July 12/28 est.; delivered July 15/28 est.

GREAT LAKES ENGINEERING WORKS.

River Rouge, Mich.

Purchasing Agent: Chas. Short.

The Straits of Mackinac, hull 261, auto ferry for State of Michigan; 190 L.B.P.; 48' beam; 12 loaded draft; 11 knots speed; T.E. engs. 1000 I.H.P.; 2 Scotch boilers; 11'10" diam.; keel Feb. 29/28; launched Apr. 28/28; delivered June 15/28.

Hull 262, flat scow for Great Lakes Dredge & Dock Co.; 130'x32'x10' depth; keel Feb. 8/28; launched and delivered June 20/28.

Hull 263, derrick scow for above; 120'x 42'6"x10' keel Feb. 16/28; launched June 10/28; delivered June 20/28.

Hull 264, derrick scow same as above; keel Feb. 18/28; launched June 20/28; delivered July 1/28.

HOWARD SHIPYARDS & DOCK COMPANY.

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickie.

Hull 1641, towboat hull for Island Creek Coal Co., Cincinnati; 135'6"x26'6"x5'; keel Feb. 28/28; launched May 24/28; delivered June 15/28 est.

Hulls 1644-5 inc., two barges for U. S. Engineers, Huntington, West Va.; 80x26 x5 ft.

Hull 1646, barge for U. S. Engineers, Huntington, West Va.; 80'x18'x4'6".

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 241, diesel tug for Great Lakes Dredge & Dock Co.; 114'6" L.B.P.; 27' beam; keel Feb. 16/28; launched Apr. 26/28; delivered July 15/28 est.

Hull 242, steam tug for Fitzsimmons Connell Dredge & Dock Co.; 75'x16'; launched Apr. 3/28; delivered June 1/28.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Twenty steel hoppers cargo barges for

Magdalena River, Colombia; 125'x26'6" ft.; 15 delivered.

Stern wheel towboat for South America; 170'x42'x5'; launched.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6".

Hull 235, sister to above.

MIDLAND BARGE COMPANY

Midland, Pa.

Not named, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x5ft. 6in.; steam tandem comp. eng. 14"x28"x7'0" stroke; keel March 1/28; launched June 23/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6'6"; keels laid.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6".

One steel barge for P. M. Adema, Pointe a la Hache, La.; 120 x 36 x 6 ft.

Four dump scows for Div. of Canals and Waterways, State of New York; 100'x28'x 7'6".

Six deck scows for Div. of Canals and Waterways, State of New York; 75'x25'x 5'6".

Forty discharge pontoons for U. S. Engineers, Rock Island, Ill.; 38'x14'x3'.

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7'.

One barge for Heekin Can. Co., Cincinnati, Ohio; 125 x 25 x 4 ft.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Cathrine D. hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P. diesel engs. keel May 15/28; launch Aug. 10/28 est.; delivered Sept. 1/28 est.

Hull 148, hopper barge for Standard Unit. Nav. Co.; 49'x16'x6 ft.; keel Feb. 29/28; launched and delivered May 13/28.

Hull 149, towboat for Standard Unit Nav. Co.; 92'x24'x5 ft.; keel May 10/28; launch Jan. 1/29 est.

Hull 150, deck barge for stock; 120'x30 x 6 ft.; keel May 6/28; launched June 18/28; delivered June 30/28.

Hulls 151-152, two deck barges for stock; 100'x24'x5 ft.; keels May 24 and 28/28.

Hull No. 153, dredge hull, 100'x30'x4'; keel June 17/28; launch July 12/28 est.

Hull 154, deck barge for stock; 120 L.B.P.; 30 beam; 7 loaded draft; keel July 5/28 est.

Hull 155, same as above; keel July 12/28 est.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft.

Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft.

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CORDES BROTHERS

Representatives

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SAN FRANCISCO, CALIFORNIA

Hull 162, deck barge for stock 169' x 32' x 7 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Not named, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Not named, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement; keel Aug./28 est.; deliver Mar. 13/31 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line, 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launch Aug. 18/28 est.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6 3/4" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox W.T. boilers; 12 gross tons; 2600 S.H.P.; keel July 3/28.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18 1/2 mi. speed; 1784 gross tons 2600 I.H.P.; 4

cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27; launched Feb. 6/28; deliver July 12/28 est.

P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; keels July 9 est.; launch Aug. 1/28 est.; deliver Sept. 1/28 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va. General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 96' loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. engs.; keel July 13/27; launched June 16/28.

Not named, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450 I.H.P. engs.; keel Feb. 18/28.

SPEDDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named hull—, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 100 H.P. Standard diesel eng.

STATEN ISLAND SHIPBUILDING CO., Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plane and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

SUN SHIPBUILDING COMPANY Chester, Penn.

Purchasing Agent: H. W. Scott.

Sun, hull 110, motor tanker for Sun Oil Co.; 480 L.B.P.; 65'9" beam; 37 draft; motive power not yet determined; keel Dec. 21/27; launch July 14/28 est.; deliver Aug. 21/28 est.

Hull 111, oil barge for Utility Oil Corp.; 175'3 1/2 x 61'2 1/2"; keel Apr. 16/28; launched June 14/28; delivered June 16/28.

Hull 112, carfloat for Reading Railroad; 200'3 1/2 x 7'9"; keel Apr. 30/28; launch July 14/28 est.; deliver July 20/28 est.

Hull 113, same as above; keel May 1/28; launch July 24/28 est.; deliver July 30/28 est.

Hull 114, same as above; keel June 15/28 est.; launch Aug. 2/28 est.; deliver Aug. 9/28 est.

Hull 115, same as above; keel June 29/28 est.; launch Aug. 11/28 est.; deliver Aug. 18/28 est.

TOLEDO SHIPBUILDING CO. Toledo, Ohio

Purchasing Agent: Otto Hall.

Hull 179, dump scow for Central Dredging Co.; 144 x 42 ft.

Hull 180, same as above

THE CHARLES WARD ENGINEERING WORKS Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Alpha, hull 66, twin screw tunnel towboat for Alpha Sand Co., St. Louis, Mo.; 85' x 21' x 6'; two Fairbanks-Morse 180 H.P. diesel engs.; keel Mar. 15/28; launched May 16/28; delivered June 7/28.

Not named, hull 67, stern-wheel towboat for stock 64'9" x 18'4" x 5"; 100 H.P. Fairbanks-Morse diesel engs.; keel Mar. 30/28; launched June 11/28.

Captain Eric Berdland, hull 68, towboat for U.S. Engineers, Vicksburg, Miss.; 64'9" x 18'4" x 5"; 100 H.P. Fairbanks-Morse diesel

eng.; keel Apr. 16/28; launched June 28; deliver July at Monroe, La.

Not named, hull 69, steam propelled towboat for Inland Waterways Corp., Washington, D.C.; 140' x 25'9" ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal.

Incor, hull 70, twin screw towboat for International Cement Corp., New York; 126' x 26'7" ft.; 2 Fairbanks-Morse 360 H.P. diesel engs.; keel May 18/28; launch July 14/28 est.; deliver Aug. 10/28 est.

Hulls 71-72, two steel maneuver boats for U. S. Engineers Office, Pittsburgh; 60' x 22'4" ft.; keel of No. 71, June 19/28.

Captain George, hull 73, twin screw tugboat for U. S. Engineer Office. Galveston; 65'6" x 17'7" x 7 1/2"; 190 B.H.P. Winton diesel eng.

Hull 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army Engineers; 127' x 30' x 4'6"

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD. Union Plant.

Drydock, clean, paint, misc. repairs: stmrs. California, Geo. L. Olson, D. G. Scofield, W. S. Miller, Point Loma, Sinaloa, Daisy Putnam, whaler Port Saunders, Shell Co. Barge No. 6, stmrs. Admiral Moser (also draw tailshaft for inspection; make new shaft), Captain A. F. Lucas, Mexican, Boobyalla, West Sequana, El Segundo, U.S.S. Saratoga, barge Daylight (no repairs). Boiler repairs: tug Pilot, U.S. Ramapo, Makura (also engine). Propeller repairs: stmrs. Corsicana, Mexican, m/s. Geisha. Tailshaft repairs: stmrs. Nora, U.S.A.T. Meigs, Boobyalla, Napa Valley, Queen. Engine repairs: stmr. J. C. Fitzsimmons, Emv're Arrow, Admiral Benson, Victorious. Windlass repairs: stmrs. Tillamook, Nora. Hull repairs: yacht Pointsettia, m/s. Silverfir, Rigi. Misc. repairs: Tascalua, Emidio, Oleum, West Prospect, Shabonee, Cathwood, Los Alamos, Elkrige, Montebello, Plibwood, W. S. Rheem, Manhattan Island, Willkono, Argyll, Varanger, San Patricio, Tecumseh, Esperanza, J. H. Baxter, Solano, Point Bonita, Claremont, Jane Nettleton, Caspar, Necanicum, Willango, Martha Buehner, King Barge No. 2, J. B. Stetson, Carlos, Tacoma, La Perla, Arizona, General Smuts, West Elcagon, San Mateo, Marie Bakke, Oaxaca, Point Gorda, Esparta, San Jose, Mongolia, President Polk, U.S.A.T. U. S. Grant, Limon.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Purchasing Agent: E. Podmore

Bottom and bow damage repairs; tail shaft inspection and new hub; Canatco. New propeller mounted and new starboard tail shaft installed; Manasoo. Examination and survey; temporary repairs to tank top; Agawa. Hull caulked barge Dan Proctor.

PRINCE RUPERT DRY DOCK & SHIPYARD Prince Rupert, B.C.

Dock, clean, paint, annual overhaul: Birnie. Building 20 8000-gal. steel tanks for Canadian National Steamships. Dock, clean, paint, hull and engine repairs to 21 fishing boats. Dock, clean, paint, carpenter work to 2 scows. Misc. hull and machinery repairs to 31 fishing boats.

U.S. NAVY YARD Bremerton, Wash.

Dock and misc. repairs: New Mexico, Reno, Henshaw. Misc. repairs: Idaho, Percival. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyoma.

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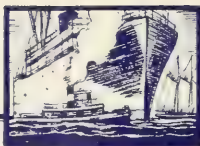
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Trade, Traffic, and Shipping

Foreign Trade in 1928

Hails Greatest World Export Trade Since Before the War

WE are in the midst of the world's greatest foreign trade year since before the war," says the National Foreign Trade Council, in issuing **Foreign Trade in 1928**, the proceedings of its Houston National Foreign Trade Convention, which is recently off the press. The Council estimates that the volume of the world's export trade this year is more than ten per cent greater than the corresponding trade carried before the war.

The 48 principal trading nations of the world did \$19,482,000,000 worth of export business last year compared with corresponding figures of \$18,400,000,000 for 1925, which was the first year when the world actually exceeded the pre-war volume of exports.

The 1913 export total of these nations was about \$17,700,000,000. The present figures, computed according to 1913 dollar values, show the world has gained in actual volume of export trade \$1,782,000,000, or slightly in excess of ten per cent in the course of its rehabilitation from the war.

The Houston convention specialized on Latin America, and it is noteworthy that ten nations south of Panama, led by a strong advance in Argentina, showed a total real gain in exports for the last two years of almost 20 per cent, making South America the area of the most rapidly increasing export trade growth in the world. The United States and Canada, with a slight recession in export trade in dollar values during the past two years, each gained about 4 per cent in increased volume of export trade in the present market of falling export prices. Central America, including Cuba and Mexico, gained about 5 per cent, Western Europe about 4 per cent, Asia about 1 per

cent, while Australia and New Zealand fell behind about 2 per cent between 1925 and 1927.

The Houston convention attracted the attention of the American people to the great possibilities of trade with Latin America by stressing the fact that despite political prejudices in some quarters business communities throughout Latin America regard the United States as their logical buying and selling market. It was brought out in the course of the sessions that combined purchases of Latin Americans in this country, exceeding \$900,000,000, were greater than their purchases from England. France and Germany combined during the year 1927.

The report of the Houston convention includes a series of nine Export Merchandising Sessions comprising the A B C of modern American export practice from nine authoritative experts.

The leading address of the convention, that of George P. Auld, of Haskins & Sells, former Accountant-General of the Reparation Commission, has been reissued in pamphlet form as "The Mythical Transfer Problem" and has had a

worldwide circulation. Other outstanding addresses include "The Merchant Shipping Issue," by Norman F. Titus, Chief of the Transportation Division, Bureau of Foreign and Domestic Commerce; "Foreign Trade Aspects of the Tariff," by George C. Davis, customs adviser, National Council of American Importers and Traders, Inc., New York; "The Foreign Trade Outlook," by Eugene P. Thomas, vice-president, United States Steel Corporation, New York; "The Department of State and American Enterprise Abroad," by William R. Castle, Jr., Assistant Secretary of State, Washington; "Foreign Trade Development of the Gulf Ports," by James P. Butler, president, Canal Bank & Trust Co., New Orleans; and "Foreign Trade Progress," by James A. Farrell, chairman of the National Foreign Trade Council.

The number of delegates attending the convention was 1132, including more than 50 visiting delegates from 19 foreign countries. A full list of delegates present together with the final declaration of policy and principles adopted and a comprehensive reference index accompanies the report.

The Foreign Trade Outlook

(Continued from Page 363)

ready grown to something like 1½ billions of dollars and our proportion of South America's imports had risen to 28 per cent. Our investments in Central America had also grown to well over a billion dollars, and our exports to those countries had grown to more than 60 per cent of their total imports.

In Argentina and Brazil, our investments have largely consisted of loans to national governments, provinces and municipalities, and only to a limited extent of partici-

pation in productive enterprises over which our investors exercised control. On the other hand, our investments in Chile and Peru, particularly in copper mining and nitrate exploitation, have been very large; and, as a result, our share of the imports of those countries is very important—much greater than in Argentina and Brazil. It, therefore, behooves us, in order to increase and develop our export trade, to assist to the fullest pos-

McCormick Terminals Are Models of Their Kind

Increasing appreciation of the McCormick Steamship Company's extensive services to both Americas is due, in part, to our Pacific Coast Terminals. In principal ports from Seattle to Los Angeles Harbor, vessels in any of our five services load and unload at large centrally located docks under our own operation.

This gives West Coast Shippers and consignees many important advantages when shipping "via McCormick." From our conveniently located terminals in each city, deliveries to city, barge, rail and truck lines are made with the least inconvenience. Everything essential has been provided for quick and efficient transfer of cargo.

Some facts of interest:

San Francisco — Pier 37 and Pier 4 — Pier 4 used exclusively for Coastwise service. South Ferry Building for Intercoastal and South American steamships. North Ferry Building for other foreign ports. Use of two piers eliminates all possible confusion.

Los Angeles Harbor — Pier 177 and Pier 178. Located nearest to the city, other terminals in vicinity are far from shore.



Use Angeles than the terminals on outer harbor. Provides direct access to city from pier.

Portland — McCormick Terminal and Municipal Terminal No. 2. Both East and West side of river. McCormick Terminal on West side, center of business district and Municipal Terminal on East Side.

Tacoma — McCormick Terminal. Considered finest located in Tacoma. Locative, ample space for handling lumber.

Seattle — Pier 9. New McCormick location in center of business district.

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*M.S. City of S.F.	Aug. 4	Aug. 6		*M.S. City of Panama	Aug. 10		
*S.S. Ecuador	Aug. 11	Aug. 13		*S.S. Venezuela	Aug. 18	Aug. 28	
*S.S. Corinto	Aug. 25			*S.S. Guatemala	Sept. 1	Sept. 11	
*S.S. Colombia	Sept. 1	Sept. 3		*M.S. City of S.F.		Sept. 9	
*M.S. City of Panama	Sept. 15	Sept. 17		*S.S. Ecuador	Sept. 15	Sept. 25	

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York.

‡Refrigerator Space.

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sible extent in developing the vast resources of Latin America by the investment of American capital under the control of American business men and engineers. All experience has proved that such development does not injure nor restrict the trade of the European nations, which, as we have shown, are under the most urgent necessity of increasing their exports, but on

the contrary, the development of the resources of Latin America will enormously increase the consumptive power of the countries to the south of us, and, while creating demand for our goods, will contribute to general world prosperity by furnishing additional and profitable outlet for the products of Europe.

American Import Trade

DESPITE generally lower prices, imports for the first quarter of the year exceeded one billion dollars for the thirteenth consecutive quarter, as shown in a bulletin on "Our World Trade" just made public by the Foreign Commerce Department of the Chamber of Commerce of the United States. During the first quarter imports, amounting to \$1,069,000,000, were slightly more than two per cent greater than for the same period a year ago.

Chemicals and inedible animal products ran well ahead of 1927, while metals showed the heaviest percentage of drop. Thirty-one of the fifty principal imports of the United States in the first quarter of 1928 showed increased values ranging as high as 93 per cent over the values for the same period of the preceding year. In volume, 61 imported articles out of a total of 103 also increased. A number of these import gains were in competitive manufactured commodities, including paper, copper, leather, textiles, gasoline, and coal-tar products. Our three leading im-

ports, raw silk, crude rubber, and coffee, each totaled about \$90,000,000 for the first quarter of 1928. These three commodities, none of which is produced in the United States, constituted one-fourth of the total imports.

During the quarter we imported 18,370,000 pounds of raw silk, principally from Japan, a huge quantity, 10 per cent greater than the amount imported in the first quarter of 1927. Owing to lower prices the value, \$90,204,000 showed a 2 per cent decline.

Imports of crude rubber, also at somewhat lower prices, continued heavy, with receipts for the first three months of this year totaling 254,000,000 pounds, having a value of \$90,151,000, 6 per cent larger in volume and 2 per cent greater in value than a year ago.

During the first quarter of 1928 our receipts of coffee totaled 430,023,000 pounds, the largest amount imported into the United States in one quarter. At an average price of 20.8 cents a pound, the total value was \$89,597,000.

American Export Trade

THE "Big Five" among the buyers of American merchandise—United Kingdom, Canada, Germany, Japan, and France—purchased more than one-half of all American exports during the first quarter of 1928, says a report on "Our World Trade" made public today by the Foreign Commerce Department of the Chamber of Commerce of the United States. Sales to Canada, Germany, and France in the first quarter were greater than a year ago, while those to the United Kingdom and Japan fell off.

Exports to Canada amounted to \$187,990,000, a sales figure exceeding that of last year by \$17,843,000, 10 per cent. Sales to Germany

amounted to \$115,131,000, a gain of \$2,128,000, or 2 per cent over last year's purchases. Our exports to France, amounting to about half those of Germany, totaled \$55,694,000—an increase of \$4,616,000, or 9 per cent.

Purchases by the United Kingdom suffered a severe decrease, sales to that country for the first quarter of this year totaling \$213,843,000 as against \$233,071,000 a year ago—a falling-off of \$19,228,000, or 8 per cent. Our sales to Japan declined from \$74,295,000 to \$61,303,000, a loss of nearly 13 million dollars, or 18 per cent.

Among the second five, Italy, the sixth leading buyer of United States merchandise, made the large-

est gain, \$6,062,000, her purchases in the first quarter of this year amounting to \$39,497,000 as compared with \$33,435,000 for the corresponding period of 1927—an increase of 18 per cent. Exports to the Netherlands, number 8 among our markets, totaled \$38,281,000—a gain of \$5,092,000, or 15 per cent. Sales to the Philippine Islands made almost as large a gain—\$4,962,000, or 34 per cent, with total purchases amounting to \$19,742,000.

New Tariff Lists Many Ports

NEW freight rate tariff effective July 1 covering commodities moving from the Pacific Coast to the Mediterranean, Africa, the Levant and Black Sea ports is being used by the General Steamship Corporation, general agents for the Libera Line of the Navigazione Libera Triestina, Trieste, Italy. Besides the main ports of call, namely, Barcelona, Marseilles, Genoa, Leghorn, Naples, Venice, and Trieste, through rates are quoted to all Italian minor ports and to 134 named additional ports. Shipment under through bills of lading is thus made possible to all principal points in Canary Islands, Africa, Spain, Greece, Rumania, Bulgaria, Turkey, Cyprus, Gibraltar, Portugal, Russia, Syria, Algeria, Morocco, Egypt, and India.

The large range of ports now reached through the services of the Libera Line is a significant index to the development of the direct trade of the Pacific Coast of the United States during the past few years. Another feature of interest is a reduction in the rate on used automobiles which are taken abroad by tourists, making it particularly attractive to passengers to ship their cars to Europe for touring.

Vessels engaged in the Libera Line service of the General Steamship Corporation include the new, fast motorships Cellina, Leme, Feltre, Fella, and Rialto.

JOINS STAFF OF SQUIRES & JONES

R. M. Stevenson, well-known and popular marine engineer, has been appointed marine salesman by the firm of Squires & Jones, managers in California for Federal marine paints and New Jersey Asbestos products. Mr. Stevenson's headquarters will be in San Francisco.

Port Said, Panama, Keil . .

There are Shell installations at all of them, of course. For they are gateway cities—where sea meets sea and ocean going commerce is concentrated.

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SHELL COMPANY
OF CALIFORNIA



Reduced Rates on Air Mail Effective August 1

By Arthur C. Lueder, Postmaster, Chicago, Illinois

IT will cost only one-quarter as much to send the average business or social letter by air mail on and after August 1 as it does now, for on that date the rate will be reduced from ten cents a half ounce to five cents for the first ounce or fraction and ten cents for each succeeding ounce or fraction. This means that an ordinary letter may be sent anywhere in this country for five cents and that an air mail package which now requires \$2 postage may then be sent to any part of the country for \$1.05.

This new low rate effective August 1 holds out tremendous possibilities for the American business man. This reduction comes when the air mail companies are giving the most dependable service in their history. The man or woman using air mail for business or social correspondence has the benefits and connections of twenty-eight air mail

routes over 12,457 miles, serving 62,000,000 people directly and millions more indirectly. Each twenty-four hours the mail planes fly 20,000 miles and their daily average mail load now exceeds three tons. Air mail averages more than 100 miles per hour and planes are flown night and day in fair or foul weather.

Speed is the essence of air mail service and the record of efficiency established by the air mail in the last ten years, during which time nearly 16,000,000 miles were flown and 302,000,000 letters carried, merits the patronage of every business man and woman.

It behooves every alert business man to instruct his mailing department to determine where and how time and money can be saved by use of air mail. Each day there is some striking instance of how air mail, which means speed, has been profit-

able to American business. The new rates effective August 1 should popularize this rapidly expanding method of modern transportation.

The regulations on air mail are simple. Any mailable matter (except perishable matter liable to damage by freezing) may be sent by air mail. Registered, insured, and C.O.D. matter is carried by air mail as are packages not exceeding fifty pounds in weight and not exceeding 84 inches in length and girth combined. Special delivery stamps still further expediate delivery of domestic air mail.

Air mail may be deposited in any mail box. Distinctive air mail envelopes are desirable, but not compulsory, but the words "Air Mail" or "Via Air Mail" must be clearly endorsed on the envelope or wrapper.

Freights, Charters, Sales

July 10, 1928

THE following grain fixtures are reported from the North Pacific to U. K.-Continent: A str., San Francisco to U. K.-Cont., 31/3, September, Strauss & Co.; a str., Vancouver to U. K.-Cont., 29/-, Nov./Dec.; Jap. str. Maru, Portland to U. K. Cont., 28/9, July; British str. Skegness, Portland to U. K.-Cont., 28/-, Kerr Gifford & Co.; British str. Rio Claro, same, 28/6, Aug., Balfour Guthrie & Co.; British str. Alness, same; British str. Jersey City, Vancouver to U. K.-Cont. 26/-, July, Canadian Cooperative Wheat Producers; British str. Ben . . . , San Francisco to U. K., 31/3, Sept.; British str. Baron Carnegie, Puget Sound to U. K.-Cont., 28/-, July; a str., San Francisco to U. K. Cont., 29/6, Aug., Balfour Guthrie & Co.; British str. Ben . . . , San Francisco to U. K.-Cont., 30/9, Aug.; a str., same.

The British str. Springbank is reported fixed with lumber from Grays Harbor to Sydney, by American Trading Co.

The American str. W. R. Chamberlin is reported fixed with redwood from Eureka to Cuba and Porto Rico, June loading, and the American str. Henry D. Whiton from the North Pacific to New York, lumber, Aug., by R. R. Sizer & Co.

The British str. Ullapool is reported fixed from North Pacific to London with lumber and general merchandise, July loading, Canadian American Shipping Co., and the British str. Reedpool from North Pacific to West Hartlepool, lumber, 57/6, Aug./Sept. loading.

The following tanker fixtures are reported: American str., Papoose, California to North of Hatteras (not east New York), 83c, middle July; Swedish m.s. Gustaf E. Reuter, California to U. K.-Cont., 27/6, Aug., clean; British str., Oleander, California to Japan, 68c, Aug.; Norwegian M. S., Rania, California to U. K.-Cont, 29/-, July.

The following time charters are reported; British m.s. Glenmoor, North Pacific to Australia, 9/11 months, American Trading Co.; British M. S., Innesmoor, Pacific trade, delivery Colon, redelivery, China via North Pacific, \$1.50, June, J. J. Moore & Co.; British str., Jedmoor, delivery Colon, redelivery Australia via North Pacific, \$1.55, July, J. J. Moore & Co.; British str., Hopeworth, Pacific trade, 9/12 months, delivery North

Pacific, redelivery Japan, \$1.50, July; Norwegian str., Sammanger, Pacific trade, 5/7 months, delivery North of Hatteras, redelivery Japan, 90c, prompt; Swedish M. S., Pajala, delivery Colon, July, redelivery U. K.-Cont. via North Pacific,

\$1.20, Canadian American Shipping Co.

The American sc. Margaret F. Sterling is reported sold for \$4300 from U. S. Marshal to Capt. Pettersson & Co.

PAGE BROTHERS,
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California Sugar at New Orleans

THE Western Sugar Refinery, one of the divisions of the J. D. & A. B. Spreckles Investment Company of California, on June 28 entered into a lease with the Board of Commissioners of the Port of New Orleans for 25,350 square feet of floor space in the Army Supply Base Warehouse No. 1, with preferential right to use of the first floor wharf and shed connecting therewith, by all vessels handling their products. The leased premises are to be used exclusively the handling and distribution of sugar for the account of the refinery company, who are granted use of all loading platforms and all switch tracks serving the warehouse, with permanent allocation of four carlengths of side track for the period of the lease.

This lease follows close on a similar contract which the dock board made with the Seavy & Flarsheim Brokerage Company, agents

for the California-Hawaiian Sugar Company, for space in the same warehouse, and attests the growing importance of New Orleans harbor as a centration and distribution point. The movement of sugar in particular has increased tremendously during the present year due to the facility with which the principal consuming centers can be reached from New Orleans, and to the favorable combination of rail and water rates which has resulted from the development of traffic through the Panama Canal in connection with the rail and barge line services at New Orleans.

The warehouse involved in this lease is a structure six stories high, 84,000 square feet to each floor. The entire area is now occupied by industries which use the Poland Street public wharf and shed, with which it is connected by covered runways.

Labor as a Factor in Cargo Handling

(Continued from Page 365)

forced idleness, quite common; and a personal injury rate that can best be measured by the insurance premium of approximately 20 per cent of the payroll (every sixth man working to carry the premium on the other five). It would almost seem as though the best solution to the longshore labor problem is to eliminate the longshoreman by the ininventiveness of the terminal engineer. This actually has taken place on the Great Lakes.

It seems fair and moderate to say that much more attention has been paid in port affairs to material than to personnel. Factory engineering and management a generation ago began passing from exclusive attention to mechanical progress to a balance of human and mechanical progress today. There is need of that same balance in shipping, on and offshore. The field of the terminal engineer is human design as well as mechani-

cal; of the terminal operator, the handling of personnel as well as material.

—(From World Ports).

Plans for Pacific Ship Construction

Among the Pacific Coast concerns which have indicated their intentions to take advantage of the favorable conditions of the Merchant Marine Act of 1928 and to plan a construction program of new tonnage are the Matson Navigation Company for its San Francisco-Australia service; the Dollar Steamship Company for its Seattle-Oriental service, also its round-the-world service; and Captain Frank H. Ely of Los Angeles, who has long had plans for the development of a line of refrigerated ships to ply in the intercoastal service for the quick delivery of California perishables to the eastern seaboard.

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PLEASE MENTION PACIFIC MARINE REVIEW



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon.

Leo. E. Archer, Pacific Coast manager for the Panama-Pacific Line, states that the new liner Virginia, sister-ship of the California, will sail on her maiden voyage from New York on December 8, arriving at San Francisco December 24.

John Carstairs, traveling chief engineer, of the Panama-Pacific Line, who is now supervising the installation of machinery aboard the liner Virginia and who will take the maiden trip to the Pacific Coast as master of the propulsion department, will also supervise the same details during the building of the liner New York, just ordered.

Nicholas S. Potter, yacht designer, has left the Wilmington Boat Works, Wilmington, California, to become associated with the firm of Wilson, Proctor & Wilson at Wilmington, as naval architect and consulting engineer. During his tenure with the Wilmington Boat Works, Potter designed some of the finest and fastest yachts sailing the Pacific.

The arrangement between the Los Angeles Steamship Company and the Western Air Express for a joint "one way by water; one way by air" service is proving highly popular with the traveling public, according to Roy V. Crowder, passenger traffic manager of the Los Angeles Steamship Company. The combined air and water travel service was instituted by Mr. Crowder as a means of facilitating rapid transportation between Los Angeles and San Francisco.

A combination water and air service has been inaugurated by the White Star Line, according to Leo E. Archer, Pacific Coast manager of the line. Ten-seater Farman-Goliath planes meet the vessels of the line at Cherbourg and carry passengers from that city to Paris at slightly additional cost over the ordinary steamship fare. In commenting upon the combination of water and air traffic Archer said that if the experiment is successful it will be established as

a regular service. The planes enable passengers to save five hours.

Earle C. Wilson, former well known purser on runs from the Pacific Coast to the Orient, was a passenger on the Panama-Pacific Line's steamship California on her recent sailing from San Francisco. Wilson, now associated with John Tompkins at the Great Western Power Company in Oakland, will visit in Havana and then tour the East. He is accompanied by Mrs. Wilson.

The Holland-American Line has contracted for the construction of a motorship for its European-Pacific service, according to an announcement of the Line. The vessel will have twin screws, will be 490 feet long and 65 feet beam. She will have a deadweight capacity of 12,000 tons and there will be 140,000 feet of refrigerator space for transportation of perishable cargo.

Quietly, very quietly, Ernest F. Prince, chief engineer of the palatial motor driven liner California of the Panama-Pacific Line took unto himself a bride during a week's stay in New York. Nothing was said of the nuptials and

the secret did not leak out until the arrival of Mrs. Prince at San Francisco by train to establish a home. Chief Engineer Prince is one of the best known and most popular propulsion masters sailing the Pacific. His bride is the daughter of an old established family of New York. The romance developed during a trip of the bride from New York to California.

New York will be the name of the third electrically-driven \$7,500,000 Panama Pacific liner, it was authoritatively learned by the Pacific Marine Review. The vessel will be similar in size and appointments to the liner California, now in service, and the Virginia, now under construction. However, it was learned that several new improvements will be innovated by P. A. S. Franklin, president of the International Mercantile Marine Company, parent company of the Panama Pacific Line.

Takio Yamato, San Francisco manager of the Nippon Yusen Kaisha, attended a meeting of the entire official personnel of the company, held in New York. Officials of the company considered a definite program for the new liners of



When Joseph Barker, for twenty-five years port engineer of the Matson Navigation Company, retired recently, he was tendered a dinner by the executives of the company. Captain Charles W. Saunders, superintendent of the Matson Navigation Company, is here shown presenting a watch in the name of the company to Chief Barker.

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the company now under construction, which they expect to put into service next year.

Captain John Fahrenholtz, veteran master of the Southern Pacific ferryboats, died recently in Oakland after a sudden illness. The captain was stricken in the pilot house of the vessel and was removed to the Southern Pacific Hospital, where he passed away. More than fifty years ago the veteran skipper assumed command of a Southern Pacific vessel and served continuously. He was born in San Francisco. He is survived by a widow, Mrs. Mary Fahrenholtz, 3038 Fulton Street, Berkeley; a daughter, Mrs. Clara Blanchfield, and a son, Captain R. Fahrenholtz.

Captain Samuel S. Sandberg, who succeeded Philip S. Teller on the Shipping Board, has been assigned to the bureau of operations of that body.

Harry P. Gray, president of the United States Engineering Company, has returned to San Francisco, following a two months' visit to the Eastern states.

July 1, the San Francisco office of the United States Lines were moved from Sutter Street to 691 Market Street. Under the direction of William G. Fitch, general passenger agent, the new offices were modernly equipped and surpass those at the former site at 50 Sutter Street.

A subsidy of \$3,325,000 for the Seattle service of the Nippon Yusen Kaisha is provided in a bill passed by the Japanese Diet, according to advices received here. Dispatches add that the subsidy will be provided at a rate of \$665,000 yearly for a period of five years. Under the subsidy the Japanese steamship firm will proceed with the plans calling for construction of three passenger motor liners to be placed in the run from Seattle to Shanghai and other Oriental ports. The three will augment the fleet of three motor liners now under construction for the company's San Francisco-Oriental service.

Cyrus A. Anderson, of Anderson, Matton Co., was elected president of the Pacific Coast Freight Forwarders and Custom Brokers' Association at the annual meeting of that body. Other officers elected were: W. C. Jash, vice-president;



The genial young man peeking through the confetti is Captain Charles W. Gilbert of the Panama Mail liner Venezuela. He measures 6 feet 6 inches in his sex, and is said to be superlatively young, tall, and popular so far as intercoastal skippers go.

James E. Lowden, secretary-treasurer; James Loudon, vice-president at Los Angeles. Directors of the Association are Frank Leighton, Harry Brown, C. D. Patterson, R. B. Parker, and G. M. Walker.

The Portland, latest of the fleet of four motorships to be built for the Pacific-European service of the Hamburg-American Line, is en route to the Pacific Coast on her maiden voyage from Hamburg. The vessel is carrying a passenger list of fifty, which is capacity, and her holds are filled with consignments for ports of the Pacific.



The Wilhelmina skipper, Captain "Kan" Hubbenette, a popular Matson Line shipmaster.

A. C. Dierick, vice-president of the Matson Navigation Company, has returned to his headquarters in San Francisco, after a business visit of several weeks in New York and Washington. Dierick attended conferences in Washington relative to mail contracts. He also conferred with Shipping Board officials about the construction of liners for the Australia service of the Matson line.

Economy of service and performance merited a large number of captains' and engineers' bonuses from the United States Shipping Board for the period from July 1 to December 31, 1927. Those masters and engineers of vessels operating out of San Francisco awarded were: J. H. Hansen, master, and Chief Engineer H. T. Berger of the American-Australia-Orient Line steamer West Calera; Captain C. H. Brum and Chief Engineer E. C. Matheson of the freighter West Chopaka. Each received a bonus of fifty dollars.

Among the number of Pacific Coast engineers and masters to receive honorable mention for the economical operation of their vessels were:

Captain C. W. Winnett and Chief Engineer H. Brinkerhoff of the freighter West Ivan; Captain Hagberg and Chief Engineer J. T. Hare of the West Nivaria; G. E. Wilcox, chief engineer, and Captain M. E. Shigley of the West Faralon; Captain J. Healy and Chief Engineer L. Drothing of the West Ison; Chief Engineer G. A. Snyder and Captain N. Y. Green of the City of Spokane; Captain A. Stinson and Chief Engineer H. L. Clements of the steamer Cuprum.

A new Empress liner has been ordered by the Canadian Pacific Steamship Company, according to announcement made by Fred Nason, San Francisco representative of that company. The new vessel is to be the largest of the fleet of Empress liners and will have a speed of 21 knots. Order for the vessel was placed with the Fairfield Ship-building Company of Glasgow, by E. W. Beatty, president of the Canadian Pacific Railway. The liner will be 662 feet long, 83 feet beam, 57 feet depth and have a displacement of nearly 26,000 tons. She will be much larger than the Empress of Scotland, which is at present the largest of the fleet.

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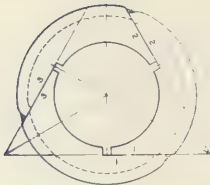
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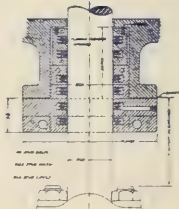
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Use of radio telephone sets for small craft operating in New York Harbor is contemplated by the New York Central Railroad Company. The Railroad Company has advised the Federal Radio Commission of their plans. The proposal is to use telephone sets of low power on approximately 300 of the small craft plying the New York waterways. The sets are to be designed for telephone work over short distances.

Tourist travel reached a new high figure and exceeded by far the prognostications made by officials earlier in the year, according to a statement issued by the Department of Commerce for the year 1928. An increase of twenty-five per cent, approximately, was indicated in the figures given by the department. This volume of travel bears not only on the transatlantic lines but the direct Pacific Coast-European services. Augmentation of the Pacific lines with modern motor driven vessels has greatly aided in bolstering passenger carrying from the Pacific shore to Europe. Recent additions to the Pacific service were made by the Hamburg-American line with four ships of large tonnage, while the Holland-American Line, Johnson Line, Furness Line, and Liberia service have placed contracts for new tonnage or are building ships to handle the increased traffic.

Whether efforts of the International Shipping Conference, held recently in London, to eliminate popular phrases of the seafarer, will bear fruit or not is a moot question. Instead of the nautical terms of tradition and ship lore the conference would substitute "right" and "left" for "starboard" and "port." Efforts to make such changes have been made repeatedly, but did not seem to take with the old school of mariners.

Maps of the seven seas indicating hills and valleys of the briny depths will be undertaken by the International Hydrographic Bureau, if that body is favorable to the proposal submitted by G. Renius, Swedish hydrographer. Renius declares that by the use of echo-sounding apparatus it is possible to draft the contour of the ocean beds with accuracy. By this means, according to Renius, mariners can make use of under-water marks to aid in the safety of navigation.



Henry Nelson, master of the Dollar round-the-world liner President Pierce. Captain Nelson is somewhat of a linguist, having learned to express himself in six languages since the beginning of the Dollar globe circling service.

Scores of friends along the San Francisco waterfront and shipping circles of the Pacific Coast mourned the passing of Captain A. C. Tibbetts, veteran master, who passed away at his residence in Eureka. Captain Tibbetts was for many years identified with the Humboldt Stevedoring Company, the American Bureau of Shipping, and the San Francisco Board of Marine Underwriters. He was 78 years. He is survived by two sons, who also followed the sea. They are Captain J. T. Tibbetts, assistant in-



Formerly chief officer of the motorship City of San Francisco, Captain Peter Hansen is now in command of the Panama Mail steamer Corinto.

spector of hulls at San Francisco, and Captain A. D. Tibbetts, master of the Admiral Line steamer Admiral Fiske. A brother, Captain W. G. Tibbetts, resides in Alameda.

Pleasant arrangements were consummated for the handling of the ensuing year's crop of coffee at the International Coffee Congress held in Paris, according to Daulton Mann, general manager of the Panama Mail Steamship Company, who attended the meet. Mann was absent about six weeks, visiting on the Atlantic seaboard, England and France where he met maritime leaders.

The Panama Mail executive was pleased with prospects of shipping conditions both on the Atlantic Coast and the Continent. He inspected the steamer Guatemala in New York. This vessel made her first voyage under the flag of the Panama Mail.

After ten years of litigation, a decision in equity awarding the United States Government a judgment of \$1,327,780 against Skinner & Eddy, war time shipbuilders, was handed down by the Federal Court in Seattle, Washington.

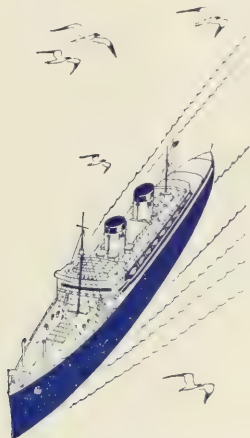
The case was appealed from an award in a previous decision by which the Government was given \$1,401,424. No notice was given by legal counsel for Skinner & Eddy that the judgment would be appealed.

Word to the Pacific Marine Review from New York stated that Captain Sir James Charles, commander of the liner Aquitania, has retired after 28 years of sea service. Captain Charles announced that he planned to make his home in London. He is one of the most popular transatlantic skippers and is known to thousands of travelers from all parts of the world who sailed aboard his ship.

Captain Harry Halvorsen, popular skipper of the coastwise passenger liner Ruth Alexander of the Admiral Line, is back on deck after six weeks' illness.

"Intercoastal conditions are highly satisfactory," was the optimistic report brought back by John E. Cushing, vice-president and traffic manager of the American-Hawaiian Steamship Company, from a six weeks' tour of Atlantic and Gulf ports.

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Alfred G. Smith, president of the American Shipbuilding Company, was buried in Cleveland, Ohio, early last month. Smith was well known in national shipping circles and was connected with the shipbuilding industry for decades.

It is reported that the Matson-Oceanic Line will order the construction of two magnificent vessels to replace the Ventura, Sonoma, and Sierra, now in service between San Francisco and Australia. These reports have it that the liners will cost \$4,000,000 each and will have a speed of 18 knots. According to the reports, the vessels are to be ready for service in 1930. William P. Roth, president of the Matson Navigation Company, announced, following a recent visit to Washington, that his firm planned construction of tonnage for the Australia run. Original rumors indicated that three ships were to be ordered by the Matson people.

The N. Y. K. Line declared a dividend of 8 per cent at the semi-annual meeting of directors held in Tokyo, according to dispatches received here. It is said that the dividend was declared upon the recommendation of T. Shirani, president, following his report that profits for six months ending March 31, amounted to 3,990,000 yen.

The Augustus, reputed to be the world's largest motorship, is expected to be placed in the regular New York-Italy service next month by the Navigazione Generale Italiana. September 15 was the date set by the Italia America Shipping Corporation, agents for the line. This largest of Italian liners is 32,650 gross tonnage, 710 feet in length, and has a 82.5 beam. The diesel motor equipment includes main and auxiliary motors, capable of developing a total of 42,600 horsepower. The vessel will have accommodations for 2700 persons distributed over eight decks. A chapel has been installed for the convenience of Catholic passengers, it was announced.

Establishment of the Stevenson Taylor scholarship award of \$500 for a course in the school of ship operation was approved at the annual spring meeting of the American Bureau of Shipping in New York. The course is the only one of its kind and is given in the Massachusetts Institute of Technology. J. Lewis Luckenbach, Cap-



Daniel Sutherland, manager of the United Engineering Company, San Francisco, who is very active in voyage repairs to large liners and in the building of pleasure craft.

tain A. F. Davison, and E. C. Gillette were named by the managers of the Bureau as a committee on the award of the Bureau's gold medal for exceptional valor at sea.

Plans for the publication of a monthly magazine to be issued by the personnel of the Coast Guard station at Government Island, were announced by members of the station. The publication, titled "Eight Bells," will be devoted to activities on the Island and profits will be directed toward the base's welfare fund. Edward Francis Sullivan has been named managing editor.



After thirty-two years as a deck officer with the Pacific Steamship Company, Captain George H. Zeh is now master of the Lasso coastwise liner Harvard.

William Fogarty, one of the youngest ship masters in service, has fully recovered from a recent operation and has assumed command of the Inter-Island Steam Navigation Company's steamer Maio. Fogarty is well known in San Francisco and was for years with the Panama Mail Steamship Company and the Red Stack Tugboat Company.

Capt. J. C. Neil, who has been with the Harbor Tug and Barge Company, Oakland, California, has been promoted to "watch officer" in charge of the headquarters on Pier 16, San Francisco. Captain Neil has been trained in operating tugs and workboats from his boyhood and knows the game well.

His predecessor, Captain Mitchell, has also been advanced in the company, being transferred to the Oakland head office as assistant to the manager.

L. J. Spence, executive officer in charge of the steamship lines of the Southern Pacific Company, New York, was a recent visitor to the Pacific Coast, accompanied by his wife and daughter. Mr. Spence is spending some weeks on the Coast and is making a thorough survey of Southern Pacific improvements and of the industrial and marine development in California and Oregon.

Trade Note

The International Compositions Company, Inc., 25 Broadway, New York, announces the acquisition by their associates, International Paints (Canada), Limited, of the Holland Varnish Co., prominent makers of industrial finishes. This acquisition makes International Paints (Canada), Limited, one of the foremost paint makers in the Dominion.

It is interesting to note that the International "organization," makers of International (Holzapfel's) composition and marine paints, now possesses fourteen factories, situated in the United States, Canada, Brazil, England, France, Norway, Sweden, Denmark, Italy, Spain, Germany, Austria, and Japan, as well as its own can and drum making plants. More than three hundred agencies are maintained, one in every port of maritime consequence throughout the world.

MACKAY RADIO AND TELEGRAPH COMPANY



Station

K. O. K.

The picture shows the **Receiving Unit** of the Mackay Marine Radio Station KOK on Reposa St. Hill, Los Angeles. KOK's second unit, the high-powered Mackay Marine transmitter, is located about twenty miles away.

Station KOK, like the other Mackay Marine Stations, KFS and KEK, is notable for its power and reach. It is ideally positioned to sweep the entire South Pacific and is of inestimable service to ships plying the Panama Canal and West Coasts.

KOK'S transmitting unit, of course, includes the typical high towered transmitting structure, but note that the Receiving unit, as pictured above, uses the modern, Kolster-created receiving loops. Efficient radio results are achieved only with efficient equipment. Mackay Radio practices the fullness of this belief, by providing Marine Radio equipment that is modern, thorough, and right—for its own stations and the hundreds of vessels it serves.

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SIGNALS FOR PILOT.
IN FOG - BLOW FOUR WHISTLES
WHEN CLEAR-BURN BLUE LIGHT OR JACK AT FOREMAST

Shipping Conference

(Continued from Page 347)

out exercising the option subsequently added by way of qualification in the Protocol to the former Convention in order to preserve the uniformity at which the Convention aims."

The explanatory note to the resolution reads: "The Protocol contains a declaration that 'the high contracting parties reserve the right of not allowing liability to be limited to the value of the vessel, accessories and freight in respect of damage caused to works in ports, docks and navigable waterways, or in respect of the cost of removing wreck, or to ratify on these points only on condition of reciprocity. It is understood, however, that the limit of liability in such cases shall not exceed £8 per ton, except in the case of the expenses of removing wreck.'"

Freeboard of Tankers. The conference approved the report of the American Technical Subcommittee on this subject, which calls for reduction in freeboard allowance for tankers carrying petroleum in bulk.

Panama Canal. The following resolution, introduced by Ira A. Campbell, was unanimously approved:

"Whereas this Conference believes that the shipping transiting the Panama Canal has now attained a volume which justifies, and in the economic operation of ships makes necessary, the operation of the canal continuously day and night, except during such time as may be required for repairs and maintenance. Now, therefore, be it resolved that this Conference recommends its members to request their respective governments to make representations to the American Government for such extension of the hours of operation of the Panama Canal as shall be compatible with the needs of proper upkeep."

DAWES PLAN WORKING

ON September 1 of this year the Dawes plan for payment of German reparations enters its fifth year and will then begin to impose on Germany for the first time the full standard payment of 2½ billion gold marks. Some economists have been foretelling much grief over the problems that will arise over any insistence on this full standard payment. Answering the arguments of these prophets, George P. Auld, former Accountant General of the Reparations Commission, in a pamphlet published by the National Foreign Trade Council, points out that the fundamental principles underlying world economies have not undergone any change simply because there has been a shift in the relative position of certain nations as debtors and creditors.

These gloomy economists have become known as the Keynes School. Of their predictions, Mr. Auld says:

"There can be no doubt that the predictions of a breakdown, unsubstantial though they are intrinsically, would tend, if given credence, to bring about that very catastrophe, just as the spread of unfounded rumors in the street has been known to cause a disastrous run on the deposits of a bank. There is a close similarity between the two cases. For the Dawes plan functions in a very real and definite sense as a part of the world credit system. Its operation today depends on the American investor. It is the dollar exchange being made available to Germany through American loans which furnishes the means of transferring the

payments out of Germany. This process, at the present stage of the reconstruction of Europe, is a wholly natural and healthy one for all concerned, and in normal conditions it seems due to go on for a long time to come. But the Keynes school is determined that the American investor shall believe it to be a dangerous and unnatural process. If the investor should take these ideas seriously and stop loaning our surplus capital to Europe, the result undoubtedly would be a political and commercial crisis of considerable proportions, affecting this country, as well as Europe. The discoverers of the transfer problem are playing with forces of a highly explosive nature, both economical and political, and their ideas ought to be clearly recognized and tagged for what they are, a body of doctrinaire theory possessing no solid foundation.

"Everybody forgets that there were huge debts before the war as well as after it. The rest of the world owed Europe 50 billion dollars in present day values in 1913, besides the 16 billion dollars in commercial and inter-ally war debts owed the United States today. But debtors paid regularly, creditors accepted new obligations as fast as old ones were paid up, and the aggregate of foreign lendings constantly increased. In actual fact, it will be 50 years, at the present rate of increase of our foreign debts, before we stand in the creditor position toward the rest of the world in which Europe actually stood in 1913.

"The sum and substance of the matter, so far as supposed dangers of debt collection in goods are concerned, is this: That if we do in the future decrease our exports and increase our imports it will be for reasons unrelated to the debts and connected solely with the matter of capital supply and demand, in circumstances which we in the past as a debtor nation and Europe in the present at a debtor continent have found to be thoroughly healthy and stimulating."

In issuing the statement the National Foreign Trade Council points out that Germany's exports for 1927 for the first time exceeded her pre-war exports, being \$2,425,000,000 compared with \$2,405,000,000 in 1913, and showing a gain of 20 per cent over 1925 when Germany took the position of the world's third exporting nation away from France.

CURRENT AMERICAN SHIPBUILDING

ON June 1, 1928, American shipyards were building or under contract to build for private shipowners 413 steel vessels of 233,147 gross tons compared with 409 steel vessels of 220,889 gross tons on May 1, 1928, according to the Bureau of Navigation, Department of Commerce.

There were 85 wood vessels of 36,068 gross tons building or under contract to build for private shipowners during the same period, compared with 77 wood vessels of 30,896 gross tons on May 1, 1928.

ERRATA

We deeply regret the error made in picking up from holdover galley a filler item that appeared on page 318 of the July issue. Charles C. Brooks, late marine manager for Fairbanks, Morse & Co. in the San Francisco territory, had passed away from the effects of "serious injuries received in an automobile accident" some weeks prior to the appearance of our July issue.

Our sympathy and humble apology are hereby tendered to the family of Mr. Brooks.



Chosen as Standard

Uncle Sam's "O.K." on "Wear-Ever" is reflected in its selection as standard galley equipment on vessels of the United States Navy and the United States Shipping Board—a tribute to "Wear-Ever" efficiency recognized, too, by the United Fruit Company, Matson Line, and others.

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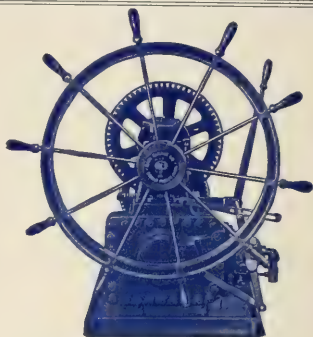
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Pacific Marine Review

The National Magazine of Shipping

SEPTEMBER, 1928

More Cargo on Less Wages and Fuel



THE new Southern Pacific cargo and passenger liner "DIXIE," which is equipped with a De Laval geared turbine, is compared with other vessels in the same service in the following table:

	CREOLE	MOMUS	DIXIE
Steam pressure lbs. gage	210	250	330
Superheat, degrees F.	50	50	200
Approximate h.p. (I.H.P. comparative basis)	8000	8500	8000
Speed in knots	15	15	15
Cargo capacity in long tons	2400	2480	5123
Cargo capacity in cu. ft.	314,716	324,332	414,055
Machinery space fore and aft, ft.	100	89	71.5
Displacement in tons	9355	9441	10,613
Average fuel consumption, New York to New Orleans and return, gals.	169,629	153,346	119,595
Propelling equipment	Triple Expansion Engine	Triple Expansion Engine	De Laval Geared Turbine

The saving in fuel cost per round trip of the "DIXIE" over the "CREOLE" is \$1,607.85, over the "MOMUS" \$1,085.40. There is also a saving in operating person-

nel of three firemen, three oilers and one junior engineer in favor of the "DIXIE", equal to approximately \$1000.00 per month, including wages and subsistence.

Full particulars supplied to those interested.

De Laval Steam Turbine Co.,
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prove the justification of this claim.*



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Pacific Marine Review

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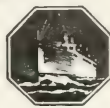
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Member of Pacific Traffic Association

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Official Organ
Shipowners' Association
of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

Safety for Marine Workers

By Byron O. Pickard, Safety Engineer, Pacific Ship-owning Associations

PREVENTING injuries to harbor workers and to seamen employed by Pacific Coast companies is now included in the program of industrial relations for the western members of the American merchant marine. It is a well-known and accepted fact that when the Pacific Coast ship owners and the allied stevedoring and harbor worker interests determine to do a thing, they are generally successful, as they are hard workers, faithful to a cause, willing to accept responsibilities, pull together, and thoroughly organize for the problems involved.

Accordingly, when, in 1926, a safety movement was proposed and later tentatively sold to the operators, an Operators' Committee was organized and a complete survey of waterfront conditions covering a period of six months was made by a well known San Francisco firm of safety engineers. Upon the completion of this survey a permanent Accident Prevention Department was organized, and actual safety work started February 1, 1927.

The present scope of the work covers all the ports in California and Hawaii, and close cooperation is maintained with the work being done along safety lines in the Puget Sound ports. The Puget Sound waterfront employers were the first to start safety for longshoremen, and they have made excellent progress over a period of three years.

The California program includes work being done by the members of the following groups: The Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, the San Francisco Bay Waterfront Employers' Union, and the Marine Service Bureau members at San Pedro and San Diego.

The Associations' Safety Committee controls the policies and activities of the Accident Prevention Department and is composed of three members from each of the three San Francisco associations mentioned above, the general manager of the San Francisco Marine Service Bureau, the president of the Longshoremen's Association of San Francisco Bay, the general manager of the San Francisco lumber longshore group, and a chairman. This committee appointed a safety engineer, who is manager of the Accident Prevention De-

partment and secretary of the committee. The committee meets in San Francisco at regular monthly intervals, and conscientiously takes a keen interest in the activities of the department.

In the Los Angeles and San Diego harbors similar committees are being organized, but they will work under the main committee at San Francisco through the manager of the Accident Prevention Department. The headquarters of the department are in the Merchant Marine Building, 256 Mission street, San Francisco.

To meet the problem of serving over one hundred different marine industrial concerns and the several different labor groups, the first unit of the organization called for by the safety engineer was the appointment of a safety contact official from each member company, who should maintain contact between the company represented and the safety engineer. Regular monthly meetings of the contact officials are held and generally are well attended. The programs for these meetings are carefully prepared, including, of course, progress reports by the safety engineer, special messages of mutual interest, and inspirational talks. The labor groups are also brought together through foremen's dinners, both for individual companies and for the entire waterfront. Monthly meetings of the waterfront general foremen are also held.

It will be noted that longshore work has been given the greatest attention, as it is presumably the most hazardous; but some time and effort are now being devoted to safety for seamen, as the seamen's work is more hazardous than is generally realized. However, as safety for seamen presents some peculiar and individual problems, it will be discussed in a later paper, and the present topic will be limited to longshoremen.

It might be of interest to note that longshoremen have received compensation for injuries received on shore, in accordance with the state act, but it was not until July 1, 1927, through the passage of a federal act, that compensation without law suits or voluntary settlements was available for longshoremen for injuries received aboard a ship (seamen were not included in

(Continued on Page 11 Blue Frame)

Peruvian Coastwise

AN interesting recent development in the strongly nationalistic tendency of South American politics, and one that is of special interest to Pacific Ocean shipping, is the enactment by the Peruvian Congress, on May 14 last, of a law reserving the coastwise shipping of Peru exclusively to ships of Peruvian registry and flying the Peruvian flag. Ships entering this trade must be owned by Peruvian citizens resident in that Republic and must have at least two-thirds of the crew, officers and men, Peruvian citizens. Corporations will be considered Peruvian if three-fourths or more of the stock is owned by Peruvian resident citizens.

This new law provides that all Peruvian coastwise mail shall be carried free of charge; that foreign cargo arriving in Peruvian vessels may remain six months longer in customs houses free of storage charge than foreign cargo arriving in foreign vessels; that Peruvian crews only will be allowed to load or discharge cargo in Peruvian ports and that all foreign vessels must employ Peruvian labor when loading or discharging.

The executive is empowered to extend the benefits of this law to any foreign vessel or vessels for such period as he may deem necessary, if, in his judgment, the application of the law exclusively to Peruvian vessels is unfavorably affecting the coastwise trade.

On November 14, 1928, this act to encourage the Peruvian merchant marine will become effective.

Honor Roll and Honorable Mention List Last Six Months of 1927

THE Fuel Conservation Committee of the United States Shipping Board has announced its semi-annual Honor Roll and Honorable Mention Roll of Chief Engineers and Masters covering the period July 1 to December 31, 1927. This list is issued twice a year and contains the names of chief engineers and masters of the fifty best performing vessels in the Shipping Board fleet and also contains what is known as an Honorable Mention List which lists those vessels that have made very creditable performances but have not quite reached the standard that would entitle them to listing amongst the select fifty. This list has been the means of stimulating competition amongst the personnel of the Shipping Board vessels, particularly to gain a place on the Honor Roll, which entitles each chief engineer and master listed thereon to a bonus of fifty dollars.

In preparing the Honor Roll and Honorable Mention List for the last six months of 1927, analysis has been made of the six months operation of 324 vessels which, in the aggregate, have travelled a total distance of 7,134,538 miles and have spent a total of 691,747 hours at sea and 551,136 hours in port during this period. To entitle the listing on the Honor Roll, a vessel must have travelled at least 20,000 miles during the period and the combined port and sea efficiency rate, which is the ratio of her actual to the standard performance, must be at least 95 per cent as high as that of the leader of her particular class of vessel.

For the six months period covered by this Honor Roll as compared to the previous six months, the re-

duction in fuel per mile factor multiplied by the total miles traversed shows a saving of 155,438 barrels of oil and 970 tons of coal at sea. The average reduction in the fuel per hour in port multiplied by the total port hours shows a saving of 50,671 barrels of oil and 714 tons of coal.

During this six months period the average price per barrel of bunker fuel oil was \$1.60, and for diesel oil \$1.95, and for coal the average price was \$6.04 a ton. Therefore, the reduction in fuel consumption represents a monetary saving for the six months as compared to the previous six months period of \$340.619.

It is felt by the Fuel Conservation Committee that the greatest factor that has made possible this continued saving is the effort that has been exerted by the operating personnel to do their share towards establishing a permanent American merchant marine which can successfully compete in the various trade routes of the world.

[illegible]

Honor roll of engineers of the Merchant Fleet Corporation.

Recent Marine Legislation Abroad

By Norman F. Titus, Chief, Transportation Division, Bureau of Foreign and Domestic Commerce.

OF late we have been so much engrossed with discussions of the Merchant Marine Act, 1928, known as the Jones-White Bill, and its probable effects upon our Merchant Marine that we have overlooked, very largely, the fact that other countries are also very deeply interested in the problems of the future of their merchant marines. It should, therefore, be a matter of considerable interest to note the outstanding developments in merchant marine legislation abroad while we have been considering and passing our Jones-White Bill.

Noteworthy legislation abroad is briefly described as follows:

French Foster Shipbuilding

The tonnage of the French merchant marine shows a large increase over its pre-war total, expanding to approximately 3,500,000 gross tons from 2,500,000 tons in 1914. Since the beginning of 1923, however, there has been a marked decline in the orders placed with the local shipyards; these have averaged only 43,000 tons annually, whereas before the war such annual construction averaged 90,000 tons. On the basis of the present fleet it is estimated that renewals through new construction should be at the rate of 150,000 tons annually.

Bill Providing New Credit Facilities Approved by Parliament. The failure of the shipbuilding industry in France not only to continue its former progress but even to maintain its position is attributed to the fact that, on the one hand, it has always been in a position of inferiority with regard to foreign competition, owing to higher costs, and, on the other, to the lack of adequate credit facilities on favorable terms. If France is to hold its own in shipbuilding against other nations who are granting a large measure of financial aid, it must follow their example; to this end, a bill presented by the Government recently passed both houses of Parliament and will be promulgated at an early date.

This bill approves a convention concluded by the State with the Credit Foncier de France, dated December 29, 1927, whereby the latter institution obligates itself to grant loans up to the average amount of 200,000,000 francs annually for five years to French owners of French ships that are either already constructed or under construction.

These loans are to be used for the construction of ships in French yards, the purchase of foreign ships less than 10 years old, or to provide the funds with which to meet annual payments due to the State for vessels constructed or purchased in Germany on reparations account; the amount for the last two objects is limited to one-fifth of the total. Where it can be proved, however, that the same ship can be constructed abroad with a saving of more than 15 per cent on the price asked by French yards, a special authorization may be granted to place the order abroad.

Nature of Security and Extent of Loans Decided. The loans will be secured by a first mortgage, and the amount loaned can not exceed one-half the value of the ships or other property given as security, unless supplementary guaranties are furnished; then the amount may be increased to 70 per cent of the value of the ships or other property covered by the mortgage. Furthermore, no loan may be made for an amount

exceeding 85 per cent of the construction or purchase price of the ships for which it is granted, and the total of loans made to the same borrower may not exceed 40,000,000 francs, unless at the end of any year the full amount of 200,000,000 francs has not been reached. Where ships are under construction, successive payments will be made based on the progress of the work, which will be verified by the Bureau Veritas.

In order to provide the necessary funds for the loans in question, the Credit Foncier is authorized to issue mortgage bonds, which will enjoy all the rights and privileges accorded to securities of this character and will be exempt from the cedulary tax on income. The rate of interest on loans made will be determined by the selling price fixed by the Credit Foncier for the latest issue of such bonds, increased by 1 per cent. Until an issue of bonds has been made, the interest rate will be that current for the mortgage loans made by the Credit Foncier on real estate, which at the time of the conclusion of the convention with that institution was 9.8 per cent but which has since been reduced to 8.6 per cent.

Government to Assume Part of Interest Charges. Since due if the rate of interest had been reduced one-half, marine with adequate credit facilities on favorable terms, the Government is authorized to assume a portion of the interest charges on the loans made where the hull of the vessel, as well as the engines and boilers, if any, are constructed in France. Where a loan is repayable in annual installments the State will pay the difference between the actual amount of such installment and the amount which would have been due if the rate of interest had been reduced one-half. However, the amount paid by the borrower can not in any case be less than the payment that would be due on the basis of an interest rate of 4 per cent. Where the loan is repayable at a fixed maturity, the State will pay half the amount of interest due up to the point where the charge borne by the borrower has been reduced to 4 per cent.

Where ships are constructed or purchased abroad, including vessels obtained from Germany on reparations account, the interest charge to be borne by the borrower will be increased by 3 per cent.

The above provisions regarding the division of interest charges were criticized in the report of the Committee on Merchant Marine of the Chamber, which expressed the opinion that, in view of the probability that current rates will decline notably in the future, the minimum of 4 per cent to be paid by borrowers is too high. Assuming that rates fall to 4 or 5½ per cent, the contribution made by the State will be decidedly small and, if the Government is ready to contribute from 4½ to 5 per cent when the current rate is 9.8 per cent, it should logically be ready to contribute 2½ per cent if the current rate falls to 5½ per cent. On this basis the committee proposed that the minimum charge to the borrower should be reduced to 3 per cent.

While the bill in question refers specifically to the convention concluded by the State with the Credit Foncier, no monopoly of maritime credit is granted to that institution, and the provisions regarding the contribution which the State is authorized to make toward the payment of interest charges on loans will also apply if loans are concluded with other institutions. How-

ever, the total of such loans can not in any case exceed an average of 200,000,000 francs annually.

Construction Materials exempt from Customs Duties and Import Tax. The bill exempts from customs duties, as well as from the import tax, both raw materials and manufactured articles intended for the construction and equipment of merchant ships, with the exception of engines, boilers, electrical equipment, anchors, chains, cordage, furnishings, etc. Furthermore, orders placed with French shipyards within five years from March 1, 1928, for the construction of merchant vessels and all engines and boilers therefor, are exempt from the business turnover tax. In addition, those foreign vessels, for which the Government is contributing to the payment of the interest on loans made, are exempt from the tax on imports which takes the place of the business turnover tax. Exception was taken by the Committee of the Chamber to the limitation imposed on this latter exemption on the ground that this limitation is illogical and that general exemption should be granted to all foreign vessels imported.

To sum up, steamship companies will now be able to borrow money on mortgage for the construction or purchase of ships, up to the limit just indicated, at half the current rate of interest on such transactions until the minimum of 4 per cent is reached. Furthermore, in the case of ships constructed in French yards, materials imported will be exempt from duty, and both such materials and orders for ships placed with French yards will be exempt from the business turnover tax.

The French hope that these new facilities will serve to place the shipbuilding industry in France in a position of equality with foreign competitors and to stimulate new production.

French Steamship Subsidy

The contract between the French Government and the Compagnie Generale Trans-Atlantique for the maintenance of regular ocean communication between France and Mexico, the West Indies and Central America was revised, and enacted by law, March 28, 1928. It replaces the contract of 1908, which expired in April 1927, and, like the old contract, is for 20 years, expiring in 1948. It virtually completes the readjustment to present conditions of the French government's prewar contracts for communication between France and French territories, populations and interests overseas. Guadeloupe, Guiana (French) and Martinique are French territory and represented in the Senate and Chamber of Deputies of the French National Assembly; Haiti was formerly French and French is its language; the Panama Canal was begun by de Lesseps, and French interests are still considerable in Mexico. The new contract is divided into two parts. The first part provides for the maintenance and restoration to regularity of existing communications with the ships now employed by the Company on the routes they serve; the second part provides for the gradual substitution of new and faster steamers on these routes.

Scope of Services. The contract prescribes a total annual service of 502,500 nautical miles, for the performance of which by the company's existing steamers an annual payment of 3,000,000 francs is allowed. Every four years after January 1, 1928, this amount may be revised to meet conditions. It calls for 38 trans-Atlantic voyages during a year by 14-knot ships, with St. Nazaire or Le Havre as terminals in France, and Habana and Vera Cruz, or Colon as the western terminals. At intermediate Spanish, Venezuelan and Colombian ports, and ports in the French, British and

Dutch West Indies and Guianas, the ships are required or permitted to stop on terms fixed in the sailing schedules. Besides these 38 voyages, 6 more trans-Atlantic voyages a year are prescribed for 11-knot ships between Le Havre and Bordeaux and ports in Porto Rico, Santo Domingo and Haiti. The 44 trans-Atlantic voyages thus require an annual mileage of about 450,000 nautical miles. The balance of the mileage is applied to two routes, each with a monthly sailing between ports in the French West Indies, Haiti, Santo Domingo and the lesser Antilles and the Guianas by 11-knot steamers, thus rounding out connections between France and its territories in the Antilles, and between those territories and nearby islands and the northern coast of South America.

Change in Principle. The new contract differs materially from the usual forms of French and European ocean mail subsidy contracts. It calls for the performance of 68 voyages a year in the public service and provides a total payment of only 3,000,000 francs, or an average of only about 6 francs a mile. The prewar contract of 1908 provided, for a like mileage and number of voyages, a subsidy of 4,078,000 francs. The apparent reduction is part of the policy of rigid reduction and accountability in expenditures enforced by the Poincare administration. Under the new contract each branch of the French Government, using the ships of the Compagnie Generale Transatlantique for these several services must itself pay for them. The new contract for example compels the company to provide the usual accommodations for mails and arrange for their delivery, but the French Post Office must pay for mails transported at rates agreed on by the Post Office and Merchant Marine Departments and the Company. In like manner the new contract requires the usual accommodations for troops, government passengers and supplies, but the payments for the use of such accommodations must be made by the War Department, Navy Department and other Departments concerned from their own funds and on a commercial basis.

Existing Fleet. The existing fleet of the company employed on the routes described comprises 12 steamers of 78,000 gross tons which cost 85,600,000 francs. Of these only two were built since the outbreak of the war, the Cuba built in 1923 in England, a 16-knot ship of 11,337 gross tons, costing 30,200,000 francs, and the Lafayette, built in 1915 at Marseilles, an 18-knot ship of 12,220 gross tons, which cost 10,855,000 francs. With its present fleet the company has not been able to comply with the contract, and somewhat slower ships than those prescribed are allowed until new ships can be built or other ships purchased with the Government's approval. The future performance of the contract requires the building of new ships in France, and to accomplish this result the Government has agreed to cooperate with the company.

Subsidies for Shipbuilding. The contract provisions for the government's assistance in the building of the company's new steamers during the next ten years are based on the fact that it will cost at present prices 400,000,000 francs (\$16,000,000) to replace with new, faster and larger steamers the eleven steamers now in use, built before 1915 at pre-war costs of 55,000,000 francs (\$11,000,000,). The government's assistance will take three forms:

1. During each of the first ten years of the contract, 5,000,000 francs (\$200,000) will be voted as a construction fund, in all 50,000,000 francs. This construction

fund is available only for building the slower ships on the line to Porto Rico, Santo Domingo and Haiti and connecting the French possession with other West Indian islands and the South American Coast.

2. As each new ship goes into commission, it is to receive a special operating subsidy, whatever its contract route may be, in addition to its share of the 3,000,000 francs voted annually for the operations of the entire fleet. While in form an operating subsidy, payable annually, this special subsidy in fact is also for the purpose of bringing by new ships the future service on all the routes up to the requirements of the times. This special subsidy is based on the first cost of each new ship, which will vary, of course, with type and time and place of build and the date when the new ships go into commission. The precise amounts of these special subsidies thus could not be stated in the contract. One can, however, approximate the cost of the special subsidies when the entire new fleet is in operation. The estimated cost of the whole new fleet is 400,000,000 francs. The contract requires that, to fix special subsidies, from this cost shall be deducted (a) the 50,000,000 francs already provided for the three slower routes, (b) five per cent of the first cost annually for depreciation of the new ships, (c) the amount received by the company for the sale of the old ships, which perhaps may be estimated at 10,000,000 francs. The account would then stand at the end of the tenth year:—

	Francs	Francs
Estimated first cost of new ships		400,000,000
Deduct total construction subsidy for new ships on three slower routes	50,000,000	
Deduct 5% annual depreciation of all new ships	20,000,000	
Deduct sale of old ships	10,000,000	80,000,000
Balance		320,000,000
Special annual subsidy, 4% of balance		12,800,000

3. **Credit Maritime.** To build the new fleet the steamship company must borrow most of the money. The Credit Maritime law of July, 1928, previously described, provides the method by which loans for ship-building, on adequate security, can be borrowed at 4 per cent, the government making good any additional interest charge. To complete the new fleet for the routes the steamship company will have to borrow upwards of 300,000,000 francs, which at 4 per cent would entail on it an annual charge of somewhat over 12,000,000 francs—about the amount of the special subsidy, when the fleet is in operation.

The new contract for the Cuban, Mexican, West Indian and Central American services of the Compagnie Generale Transatlantique is a document of 12,000 words, prescribing full details.

Chilean Ship Subsidy

The ship subsidy bill, introduced into the Chilean Congress in August, 1927, has been enacted into law in the following form, effective January 14, 1928.

Article I. The President of the Republic is authorized to invest up to 2,000,000 pesos annually in subsidizing the national steamship companies which may have maintained or may maintain for more than two years a regular service through the Panama Canal. This subsidy will be regulated in proportion to the amount of cargo moved by the respective lines.

For the purposes of the present law, companies or ships will be considered national to which Article III. of law No. 3841, of February 9, 1922, refers.

Article II. The companies which may receive the

benefits established in the previous article will share their net profits with the State under the following conditions: (a) From the profits will be deducted fines and corresponding reserves; (b) from the remaining profits there will be reserved, in the first place, a dividend up to 10 per cent annually in favor of the shares actually outstanding of the company. The balance will be distributed proportionately between the company and the State, estimating that the State has a share equivalent to the nominal value of shares equal to ten times the subsidy paid during the year to the respective companies, in conformity with Article I. of this law. That part which, according to the said proportion, belongs to the company will be distributed by the board of directors in whatever form they consider it convenient, and that part which belongs to the State shall be destined to the amortization of subsidies made effective in conformity with Article I., accumulated without interest; (c) the President of the Republic will designate a director-delegate to each company which receives the benefits referred to in Article I. of this law.

Article III. The President of the Republic is authorized to contract for the accounts of the companies, and with the corresponding fiscal guaranty, the loans which may be required for the acquisition of ships destined for foreign commerce or coastwise traffic. These loans will be guaranteed by a mortgage on the ships thus acquired or by other ships which may have the requisite required by the respective regulations, and shall not exceed more than 60 per cent of the value of the ship obtained in conformity with the regulations. The companies will deposit in the general treasury of the Republic the sum which may be necessary to take care of the service of the loan contracted in their favor.

Article IV. The subsidy which this law authorizes may be applied to private shipowners, in which case the foregoing disposition will be enforced so far as they are applicable.

Article V. Consular fees now in effect are increased 10 per cent. The return from this increase shall be destined to meet the expenses which the present law incurs.

Article VI. Within 60 days after the promulgation of this law, the President of the Republic will dictate rules for its application, and in these rules conditions of comfort, hygiene, and alimentation that shall be provided in third-class accommodations shall be set forth.

Article VII. This law shall be in effect after its publication in the Diario Oficial.

Norwegian Shipping Subsidies

In the budget proposed for 1928-29, recently presented to the Norwegian Storting, the sum of 5,804,000 crowns (about \$1,500,000) is set aside for subsidies to Norwegian shipping. The subsidies are divided between 37 different lines, all of which carry on a coastwise traffic, and the assistance takes the form of payments for carrying mail for the Government.

The Norwegian Government has for many years paid certain sums to Norwegian coastwise liners carrying mail. These payments can not be rightly considered a Government subsidy, as they are granted only to companies in coastwise trade carrying mail on lines to thinly populated districts along the far flung coast of Norway, the population of which, except for these lines, would be without means of transportation or communication with other districts.

Stars of the Pacific

II. The Star of England

By F. C. Matthews

IN August 1893 the prominent shipbuilding firm of A. McMillan & Son, of Dumbarton, Scotland, put afloat a fine steel ship named Blairmore, the hull of which now bears the name Star of England. Aside from the hull, however, the present day ship bears no resemblance to the original vessel, as her masting and rigging have been replaced more than once and her deck houses considerably altered. While operating as the Blairmore and subsequently as the bark Abby Palmer, the vessel came to be looked on by seafarers as singularly unfortunate and by some was called a hoodoo ship. However, since the change in her name to Star of England she has been a successful vessel and her old-time misfortunes have practically passed from memory.

The Unlucky Blairmore

The Blairmore was one of the fine fleet belonging to Thompson & Dickie of Glasgow and was 264 by 39 by 23 feet with a registered tonnage of 1943, gross. Her maiden voyage was out to Sydney, where, while lying in the harbor, she was run down by a steamer. A new 21-foot plate could not be obtained in Sydney; so she had to be patched up pending arrival in England where complete repairs were made. The ship again loaded back to Australia, and from Newcastle took 2934 tons of coal to San Francisco, reaching that port February 2, 1896, after a passage of 59 days. After her cargo was discharged she was towed to Mission Bay, a bight in the Bay of San Francisco, to lay up until freights advanced.

The night of April 8, 1896, was quite stormy with frequent heavy squalls. The Blairmore had 280 odd tons of earth ballast aboard and Captain Caw sent down the yards above topgallants and had run out a second anchor. Shortly before 7 o'clock in the morning of the 9th she was struck by a sharp squall while riding ahead of her anchors. She was forced against the cables tightened by the heavy strain and swung against the tide, with the wind on her beam. The combination of these forces caused her to heel over beyond her point of recovery; the ballast shifted, the bilge became the bottom, and the ship sank with open hatches in 7 fathoms of water. She took down with her the chief officer, the sailmaker, the steward, one apprentice, and two seamen. Three of these were imprisoned in the hold where they had been at work cleaning ship. The rest of the crew were rescued by boats from nearby ships whose occupants had been watching the ill fated ship for some time.

A portion of the hull of the Blairmore some 200 feet long by 15 feet wide remained three feet out of water and some of the rescuing parties heard knockings made by the unfortunates imprisoned in the hold. A hole was cut through the hull to reach these men but an unexpected result followed. The confined air which had kept the hull partially afloat, immediately escaped



The bark Abby Palmer before and after the storm November 1903. The Abby Palmer was purchased by the Alaska Packers Association and renamed the Star of England.

with great force through the opening and the ship was soon entirely submerged.

Although eye witnesses had for some time previously doubted the ability of the ship to remain upright under the conditions prevailing, particularly due to the immense amount of top hamper she carried and considering also the fact that Captain Caw had declined offers of assistance to bring his ship's head into the wind, the verdict of the naval court exonerated the captain.

The Blairmore was raised June 24 and towed into shoal water, where she was afterwards righted. Temporary repairs were made and she was towed to Oakland Estuary where she lay two years, during which time her owners were fighting underwriters in the English courts over the question of insurance. These matters being finally settled, the hull of the Blairmore was sold to Robert Sudden in August 1898 for \$28,000 and was towed to San Francisco to be completely repaired and rerigged.

A peculiar coincidence of the Blairmore being tied up at Main Street wharf, San Francisco, on August 23, 1898, was that she found docked there the British ship Earl of Dalhousie, which had capsized in Mission Bay in May 1885, when, with holds swept clean and without any ballast whatever, she had just cleared her anchorage in tow of a tug. The captain of this ship had his license suspended for six months. These two capsizing instances, occurring to ships built to stand and shift without ballast, are unique in the annals of San Francisco maritime history.

The Bark Abby Palmer and Her Mishaps

As repairs to the former Blairmore cost nearly double her sales price, she became entitled to American registry. With her lower masts and all yards shorter by some six feet than theretofore, she was rigged as a bark and on October 20, 1898, came out as the Abby Palmer and was put in the export lumber trade. In 1899, while bound from Port Hadlock to Adelaide, she encountered heavy weather and lost a portion of her

deckload. In April, 1902, she arrived at Algoa Bay from Port Gamble with loss of deckload, sails, and bulwarks. In November, 1903, while in ballast to Puget Sound from Honolulu, where she had delivered a cargo of coal from Newcastle, she was dismasted in a storm when nearing Cape Flattery. The fore and main masts, with everything attached, were carried away and she was in a helpless condition when sighted 140 miles offshore by the British steamer Vermont. With great difficulty the steamer got a hawser aboard and started the tow to Victoria. The weather was bad, the wrecked gear a great handicap, and the towing hawser parted on two occasions. The captain of the Vermont, however, pluckily stuck to the job and finally, in the evening of November 6, both vessels reached Victoria. A decision of the Admiralty Court awarded \$6500 to the Vermont.

After being rigged the Palmer took coal from Seattle to Honolulu; then sugar from the Islands to Delaware Breakwater (passage 144 days); then went out to Melbourne in 92 days from New York. From

Newcastle she took coal to Honolulu; thence to San Francisco where, in 1906, she was sold to the Alaska Packers Association.

The Bark Star of England

Refitted to suit the trade in which she was about to engage and renamed Star of England, the former Abby Palmer, ex-Blairmore, left San Francisco February 5, 1907, for Oyster Harbor and arrived back at her home port in June from Loring. Thereafter each year she has made the Alaskan voyage successfully. In October, 1908, she made the run from Loring to San Francisco in 10 days, having favorable winds all the way down. This was stated as being the record fast run over the course.

The Star of England was one of the few sailing vessels to leave for the north this season (1928). She and the ship Star of Alaska left San Francisco in company on April 3 and considerable money is said to have been wagered on the result of the "race," which however appears to have been more of a drifting match than a test of sailing capacity.

How King Zeeder Held World in Suspense

By W. C. Bunner

ONE of the biggest scares that ever reached the office of the old Pacific Mail Steamship Company, in the Flood Building, San Francisco, was cabled in from Nagasaki. The cablegram stated that the Nagasaki wireless office had to report the receipt of continued SOS calls from the Pacific Mail steamship *Siberia*, giving the location in Formosan Channel. Short as it was, that message flashed from the *Siberia's* last port of call in Japan, en route to Manila, was destined to hold the listening world in suspense for the twenty-four hours immediately following.

Its first effect was to set into immediate action every branch of the Pacific Mail Company's well organized machine of communication. Manila replied immediately to San Francisco's message ordering that port to ask the *Siberia* about her SOS. But Manila failed to get her. Next Hong Kong was asked to get into wireless touch with the alleged distressed ship. But Hong Kong had no better luck than Manila. As a result of all this cabling the head office of the management was very much alarmed.

So serious became the continued silence of Captain Zeeder, the *Siberia's* commander, that the news must be given to the public. If anything really serious had happened the sooner the public was advised of the fact the better. Procrastination under such uncertain conditions might result in very serious accusations later on.

Scarcely had the first "extra" been shouted in the street than the office in the Flood Building was bombarded by hundreds of anxious men and half hysterical women. Meanwhile both wireless and cable operators in every port bordering on the China Sea kept up an animated conversation on the all absorbing subject, "Where is the *Siberia*?"

"What were weather conditions when the speediest ship in the Pacific Mail fleet entered the Formosan Strait?" was one of the questions asked. And the answer was: "Bad, with symptoms of an approaching typhoon prevailing!"

The daily press, having nothing else with which to

feed its reading public, began delving into past history, but to their credit their general tone was optimistic. In the company's office the public was being assured that no news might mean good news in the end. However, twelve hours of persistent calls with never a whisper by way of reply, rather inclined the management to the conclusion that the worst must have happened.

On the other hand there was the *Siberia's* position when last reported, somewhere in or about the Formosan Channel, a well known breeding place for typhoons, and the management could not deny that the situation was becoming more alarming every hour.

While San Francisco was trying to possess its soul in patience, Manila, equally interested in the outcome of the trying situation, was being called upon every other minute by anxious inquirers from many parts of the world whose dear ones were either numbered among the passengers or crew of the *Siberia*.

As usual in such cases, Lloyds made its public announcement, and immediately the speculatively inclined began gambling on the fate of the *Siberia* through the medium of reinsurance, an incident which led the ignorant to the belief that there was something wrong about the handling of the news.

Finally, after the members of the passenger department had been worried into something nearly approaching nervous collapse, there was flashed across from Manila the following cablegram: "Steamship *Siberia* arrived reporting all well."

Then, of course, came satisfactory explanations. The whole trouble had originated through an incompetent wireless operator picking up an SOS sent out by a coasting vessel in distress. There was no mistake about the SOS, but the operator had made out the signature as that belonging to the *Siberia*.

This explained how the mischief originated, but what about the *Siberia's* twenty-four hours of silence? Simple enough, once officials got at the bottom of the trouble. It was learned that in the vicinity of the Formosan Channel there occasionally exists a certain static condition which it is impossible to penetrate.



Workboats and Their Power Plants

Among the Boatyards

The workboat fishing craft **Gray Hound**, has just been completed at **Nunes Brothers' Yard, Sausalito**, for Capt. J. Medina. This vessel is splendidly built, with all modern arrangements for comfort and efficiency. She is 115 feet length, 23 feet beam, with a 10 foot depth of hold. A Western-Enterprise full diesel engine of 450 horsepower was lowered into the hull by Haviside's derrick No. 2, together with all auxiliary machinery and fuel tanks. She will have a cruising radius of 4000 miles, with storage for 200 tons of fish. She will run in the off shore trade, making San Pedro her headquarters, and will be a fine addition to the big fleet of fishing craft now operating in southern waters.

The steamer **Hermosa**, well known for many years in the Catalina Island passenger trade, has been purchased by William Maggio, manager, at San Pedro for C. J. Hendry & Co., and has been converted into a diesel driven job. She has been supplied with a Fairbanks-Morse 450 horsepower plant, and all necessary auxiliaries. She will be used as a hand line fisherman and will operate between Mexican waters and the San Pedro canneries. The work of rebuilding was done by the **Los Angeles Drydock and Shipbuilding plant**. Large and comfortable quarters for crew were provided, as well as big fish storage holds.

The workboat **Boxer** operated by the United States Bureau of Education has recently arrived at Seattle after a 6430 mile cruise around Alaska waters, calling at stations and schools.

Workboats of stalwart build are needed for the log towing trade way up around Anticosti Island, Northern Canada. One of the most powerful of them is the tug **Geo. M. McKee**, which is powered with a 5-cylinder, 700-horsepower Fair-

banks-Morse diesel. The hull is of exceptionally heavy build, for during winter months when the ice is thick, this tug is used as a breaker to keep open a navigable channel to the island from the mainland. Her length is 107 feet over-all, with a beam of 12 feet and 12 feet depth, with a loaded draft of 9 feet 6 inches. A 36-kilowatt Fairbanks-Morse generator supplies current for anchor windlass and warping capstans, as well as lighting.

The engines are of the 2-cycle type and develop their full power at 250 revolutions per minute, though this speed can be exceeded easily. A sea speed of 14 knots per hour can be maintained. Fuel to permit of 4000 miles of running without rebunkering gives the boat a fine radius.

A Union 3-cylinder diesel engine of 110 horsepower has been installed in the workboat **J. K. McKenzie**, of Vancouver, B. C. This craft is 57 feet in length with a beam of 15 feet. She is equipped with a chain drive from the main shaft to a deck towing winch, and also has a shaft driven generator and storage battery to take care of the lighting requirements. She will be operated by the McKenzie Barge & Derrick Co. of Vancouver, who also have several other vessels in their fleet.

A tunnel workboat has just been completed at **Crane's Shipyard**, Coal Harbor, B. C., for Captain A. Huston. The vessel is 34 feet length by 8 feet beam. She is but 2 feet 6 inches moulded depth and is designed to run in very shallow waters. Her power is a **Universal** gas engine of 16 horsepower.

The **King Shipbuilding Company**, at Seattle, has just completed the first of five workboats for the Alaska trade. They are all on same lines, and each being 46 feet length, schooner rigged, and fitted with a

36 horsepower auxiliary engine. These vessels will be operated by the **Kananga Ranching Company** which specialize in fur trading in the Aleutian Islands. The vessel just sent out is named the **Kananga Native**; the others will be named **Unnak Native**, **Tenaga Native**, **Ilak Native**, and **Adak Native**. An investment of over \$60,000 will be involved in the building of this fleet, which is headed by Capt. Harold Bowman, president of the company.

Hibbs & McCauley, naval architects of San Francisco, have recently designed a 15-foot outboard motor boat for F. B. Hussey and Austin P. Moore, San Francisco yachtsmen. The boat, designed for high speed, will be equipped with a Johnson Racing Giant Twin Motor and is now under construction at the **Geo. W. Kneass Company's** yard, San Francisco.

Skanzie Shipbuilding & Drydock Co. at Gig Harbor, Washington, has built a great many vessels since the establishment of the plant several years ago. A fleet of ferryboats, operating between Tacoma and outlying islands, was constructed by Skanzie. During the past year, fourteen fishing and tug boats were built at the Skanzie yard, several of them being very heavily powered by diesel engines. A few months ago a floating dock capable of lifting 1000 tons, was built for the better service of the plant. This dock is electrically operated and modern in every way. In addition to the boat yard, the firm operates several ferry lines for the county.

Robert Crawford's boatyard at Gig Harbor specializes in trollers for local fishing trade. Mr. Crawford is a boatbuilder of over thirty years experience. He has been established at Gig Harbor for the past six years, and the class of work turned out by him has been of a kind to ensure repeat orders.

Six power trollers of the 35 foot class were turned out during the past year. These were powered by Standard and Hicks gas engines of the well known 20-horsepower size, so well liked by fishermen. In addition to new work, repairs of general character are handled.

J. M. Martinac yard, at Tacoma, reports very good business during the past year, quite a number of fishing craft having been completed. Among these was the Swan, a 45-footer, and the Caryl Dean, a 76-foot cannery tender, built for the Katmai Packing Co., for Alaska work. At the Martinac yard is a peculiar type of pleasure boat, a 42-foot cruiser, the hull of which was built by Tom Mairs, an automobile dealer of Tacoma. Mr. Mairs is a fine mechanic, and the hull is well constructed, though of a somewhat unconventional type. The builder, not having a steaming plant in his backyard, planked his craft with thin stuff, laid diagonally. Over this he cemented canvas, and again another planking crossing the first diagonally, the whole making a very strong and light job. The power plant is made up of two sets of Star gas engines, 4-cylinder. These are set thwartships in the hull and drive, through a 4-5/8 to 1 reduction gear, a bronze propeller. Very good speed at an economical fuel expenditure has been attained. The hull was trucked down to Martinac's yard, where a mahogany deckhouse is being built.

Western Shipbuilding Co., Tacoma, is building for Captain Nick Planchich of San Pedro, a 74 ft. long by 18 ft. beam deep sea fishing craft. The power plant has not yet been decided upon. A good year's business is reported, nine of the larger type workboats having been constructed. Among them was the freighter Belana for the Merchants

Transportation Co. of Tacoma. This vessel is 105 feet 6 inches length by 31 feet 6 inches beam. She has a Fairbanks-Morse full diesel of 200 horsepower, giving her a good commercial speed. On a draft of 10 feet she carries 400 tons of general freight.

Barbare Brothers Yard has had a very good year and has turned out a big fleet of fishing seiners, trollers, and workboats, besides their special pleasure craft, and a large run of general repairs. They have on the ways a cannery tender of the 75-foot class, which will be powered by a Pacific-Werkspoor 110-horsepower diesel. This craft is built for stock. A duplicate hull, with a 90-horsepower Washington-Estep diesel, has just been delivered to the San Juan Fishing Co. and was christened Caroline.

A freight boat, 65 feet by 24 feet, powered with an Atlas-Imperial 55-horsepower diesel, named the City of Everett and owned by Captain Grimmerson of that port, is another good sample of Barbare Brothers work.

The Tacoma Machine Works, while doing general industrial work, handle a great deal of marine repairs and manufacture a line of hardware of all kinds for fishing

boats, workboats, and yachts. Captain John Mason, manager, keeps a good crew of men on the job at all times, ready for almost any sort of marine or other work. This establishment was for many years operated under the name of Doud & McFarlane and is one of the best known in Tacoma.

Mojean & Erickson of Tacoma have finished rebuilding, for the Northwest Fisheries four trollers and have constructed four new ones. These latter are powered by Hicks gas engines in two of them and Standard gas engines in the others.

A. Strubstad operating a busy little yard at Tacoma, has built fishing and workboats for the past thirty years. He is a fine specimen of the old Norse type, and his output is strong and sturdy like the builder. He is building a 46 by 12 foot troller, which will soon be sold, his craft always having a market. During the past year nine hulls of the 35-foot troller type have been sent out from this yard. Mr. Strubstad, now well along in years, wishes to get out of the game, but his many fisher friends always ask him to build them one more boat.



Upper view shows Baron Long's yacht Norab just after her launching; 110 feet long, 23 feet beam, 8 feet 6 inches draft. She will be powered with a 300-horsepower, 8-cylinder, directly reversible marine type Union diesel engine.

At the left is shown the fine new fishing boat California just after launching; 115 feet long, 25 feet beam, 8 feet 6 inches draft, powered with a 300-horsepower directly reversing Union diesel.

Both boats were built by Campbell Machine Company and designed by Madruga, San Diego. Photos by Fassmore.



Atlas-Imperial Expansion

ATLAS-IMPERIAL Engine Company foreshadows a new era of expansion in announcing the enlargement of its board of directors and the selection of S. P. Eastman as president. The conspicuous success of Eastman in administering the affairs of Spring Valley Water Company emphasizes the importance of the news that he is to lead Atlas Diesel in its expanded program of activities.

The board of directors will now be composed as follows:

F. W. Bradley, President, Bunker Hill & Sullivan Mining Co., President Alaska Treadwell Co.;

R. I. Bentley, President, California Packing Corporation;

Max Cohn, Chairman of Board, Pacific Illinois Glass Corp.;

Gustav Epstein, partner in J. Barth & Co.;

S. P. Eastman, President, Spring Valley Water Co.; Director, Wells Fargo Bank & Union Trust Co.;

Milton Esberg, President, General Cigars Co.; Director, American Trust Co.;

J. W. Lorimer;

Athell McBean, President, Glad-ding & Co.;



S. P. Eastman, newly elected president of the Atlas-Imperial Engine Company.

Clay Miller, President, Clay Miller & Co.;

James Talbot, President, Richfield Oil Co.;

A. Warenskjold;

M. E. Wright.

With Eastman taking the presidency, Warenskjold, Lorimer, and

Wright, the founders of the business, become vice-presidents.

The Atlas-Imperial Engine Company has been in business since 1904 and since 1921 has been specializing in the development of large and small diesel engines. The company now ships its engines to all parts of the world. At the present time 33 per cent of its product is sent to the East Coast, where the company is doing a substantial business furnishing engines to the country's leading steam shovel manufacturers and locomotive builders. In the Northwest, portable diesels are being furnished to the logging industry. Attention is being given to the requirements of the mining and oil industries, where the great economy of the diesel engine is so important.

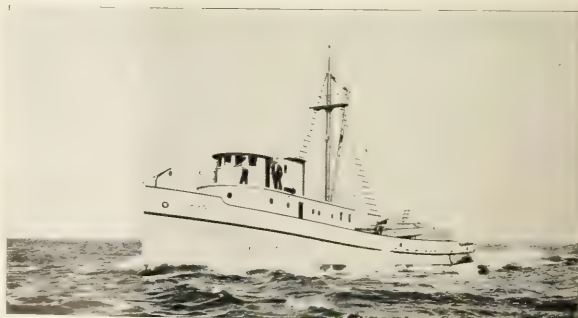
The growth of the business has overtaken present facilities, and it has become necessary to expand the corporate structure and plant facilities, and of the company. The present plant will be enlarged. Consideration is being given to the establishment of an eastern plant to meet requirements there. The new board of directors has been formed to aid in the expansion of the business.

The founders and directors who have so successfully built up the present business will continue with the new directors with added interest for the future.

Steel Fishing Boat Orient

THE latest addition to the fishing fleet of southern California is a large size all-steel boat built by the Los Angeles Shipbuilding & Drydock Corporation and engineered by the Atlas-Imperial Engine Company for the account of Messrs. Souza and Theodore and the San Diego Packing Company. This boat has been christened the Orient.

The design is the result of many conferences between the naval architects of the shipbuilding company and the experienced fish boat operators of Los Angeles and San Diego harbors. Steel was adopted because of the opportunity to get greater strength, greater rigidity, larger carrying capacity, and lighter weight with a given over-all di-



The steel fishing boat Orient equipped with a 350-horsepower Atlas-Imperial diesel. She made 10 $\frac{3}{4}$ knots easily on her trials.

mension. These features of steel construction are peculiarly valuable in the large deep-sea fishing boats which are becoming the rule in southern Pacific Coast waters. In these boats it is advisable to carry the engine well forward in order to leave clear space aft for the working platform, the bait wells, and the fish hold. With such an arrangement, it is highly important to have a rigid hull in order to preserve alignment of the long shaft to the propeller and a stiff steel girder is ideal for this purpose.

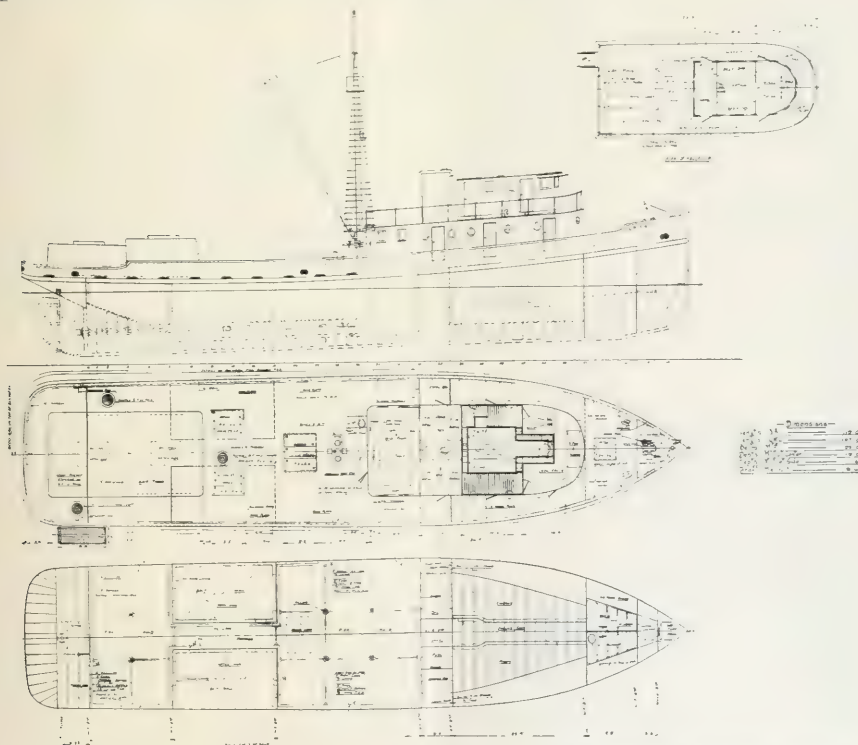
The Orient is 112 feet 6 inches length over-all, 25 feet beam, and has a molded depth of 12 feet. The plans and profile reproduced herewith show very clearly the arrangement of the hull spaces. The bait wells have a capacity for 80 tons of water and the bait tanks for 50 tons,

while the iced fish hold has a capacity for 150 tons.

All steel work inside of fish hold, all bulkheads, and interiors of bait wells and bait tanks were thoroughly covered with Hill Hubbell Biturine enamel to a thickness of 1/8 inch. On top of this enamel in the fish hold was bolted the wood grounds for cork insulation and 7 inches of cork was installed to insulate the iced fish hold. This work was done in a very thorough manner so that the steel is thoroughly protected from the corroding action of salt water and fish gurrie. The steel deck was thoroughly treated with two coats of this solution before laying the wood deck for the working platform.

The Orient is fitted with a 350-horsepower Atlas-Imperial fully reversible diesel engine directly connected to the propeller shaft. On trial trips this engine drove the

boat easily at 10 3/4 miles an hour. For auxiliary power purposes an Atlas-Imperial 27-horsepower full diesel is connected through suitable clutches and Link-Belt drive to line shafting, from which the following auxiliary machinery is driven: two Byron-Jackson centrifugal 5-inch bait pumps with capacity of 800 gallons per minute each; one Byron-Jackson centrifugal pump for ice machine; one 4-ton York ice machine; one 2 1/2-inch Blackmer rotary general service and bilge pump; one Allan Cunningham fish hoist; one Allan Cunningham anchor windlass. The line shafting for auxiliary machine drive is equipped with Timken roller bearings and is arranged so that all or any part of it can be driven from the main engine or an auxiliary gas engine should the auxiliary diesel engine for any reason be out of commission.



Profile and plans of the steel fishing boat Orient recently completed by the Los Angeles Shipbuilding & Drydock Corporation.

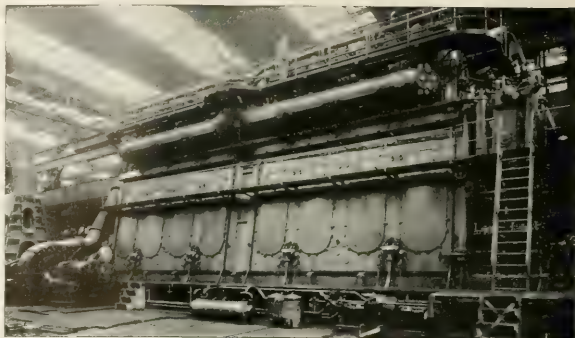
The Single-Acting Sulzer Two-Cycle Marine Diesel

DURING 1927 thorough trials were carried out on the test bed at the Sulzer works in Winterthur, Switzerland, on a double-acting 2-cycle diesel engine with a single cylinder of 900 millimeters (35.43 inches) bore and 1400 millimeters (55.12 inches) stroke.

The engine is designed for a normal load of 2000 brake horsepower when running at 100 revolutions per minute; and has been loaded up to 3000 indicated horsepower without supercharging and to 3500 indicated horsepower with supercharging during long continuous tests. This power is the highest which has ever been developed in a diesel engine cylinder, and the results of the 1927 trials are worthy to rank with those obtained by Sulzers in 1912 on a single-acting 2-cycle engine with a single cylinder of 1000 millimeters (39.37 inches) bore and 1100 millimeters (43.31 inches) stroke, developing 2000 brake horsepower at 150 revolutions per minute.

The tests with the double-acting engine are directed to the really large diesel engines of more than 10,000 brake horsepower per unit, and these tests have been carried so far that the firm is now quite prepared to tender for large double-acting 2-cycle engines for stationary plants. For marine engines under 10,000 brake horsepower, Sulzer Brothers will, for the reasons given below, keep to the single-acting 2-cycle engine.

For the fast motor liner, it must



An 8-cylinder single-acting, Sulzer 2-cycle marine diesel developing 7000 brake horsepower at 100 revolutions a minute. Engine complete on the test block at Winterthur, Switzerland.

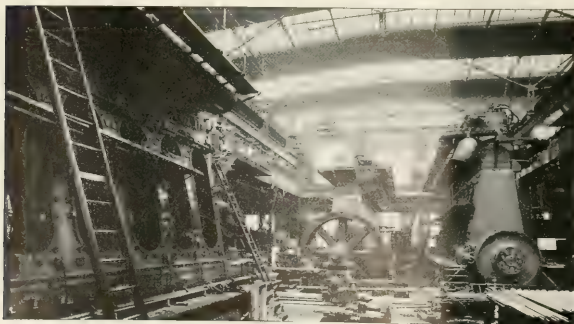
be demanded that the vessel can run year after year at a certain specified speed without interruption. In order to insure the engine room staff having their necessary shore leave, the whole work required from them when the vessel is in port shall be confined to the work of overhaul demanded as minimum by the Classification Societies. The design of the plant has to be so carefully studied that all parts subject to overhaul can be dismantled in as short a time as possible. Full attention is to be paid to balancing and to critical speeds; so that the ship may not suffer from any disturbing vibrations.

It can safely be asserted that the

single-acting 2-cycle diesel engine is the engine which complies most closely with these requirements. At their official trials, most of the ships equipped with Sulzer diesel engines have not only attained the expected maximum speed, but have exceeded it. Individual ships have repeatedly arrived too soon at their destinations. The great overload capacity of the Sulzer engines also allows a higher speed to be attained at any time. For example, during the recent official trials of the Dutch motor liner *Christian Huygens*, the 10-cylinder engines, designed for a normal load of 5800 brake horsepower at 115 revolutions per minute, were kept running for 26 hours, developing 6300 brake horsepower at 118 revolutions per minute.

No annoying vibration has been felt on any of the ships equipped with Sulzer diesel engines, although the engines run constantly at the stipulated speeds.

It can be proved that the 23,000-ton motorship *Aorangi*, which is propelled by Fairfield-Sulzer diesel engines, has always well maintained the stipulated speed of 16½ knots, and in the three years' service already completed she has missed one voyage only to allow of the periodical survey being made. The vessel stops five days in Vancouver and five days in Sydney, and in each port 1½ days are required for disinfecting, so that only 3½ days



View in the erecting shop at Winterthur, Switzerland, showing three single-acting 2-cycle diesels aggregating 17,000 brake horsepower.

are left for carrying out the normal overhaul. But this short time has proved to be quite sufficient. The actual running time of the ship amounts to 67 per cent of the total service time.

The tanker Lumen, equipped with two 1250 brake horsepower Brown-Sulzer diesel engines, has surpassed even this figure, having been to sea 311 days per annum, which represents 85 per cent of the total service time.

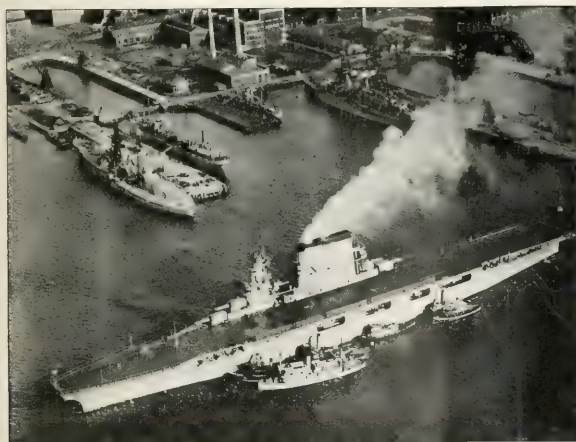
The good experience obtained with passenger liners equipped with Sulzer diesel engines, and careful consideration of the advantages and drawbacks of the different types of engines and various means of transmitting power from engine to propeller, has led Sulzer Brothers to maintain that, with the diesel engine at its present stage of development, for passenger liners requiring up to 40,000 brake horsepower the single-acting 2-cycle engine, with direct coupled propeller



Dutch passenger liner Christiaan Huygens of the Netherlands Steamship Company, Amsterdam, powered with two single-acting Sulzer 2-cycle diesels each developing 5800 brake horsepower at 115 revolutions a minute. This motorship runs between Amsterdam and Batavia and is cutting one day off her schedule each trip.

shaft, offers the soundest guarantee for trustworthy and all round satisfactory working, assuming that

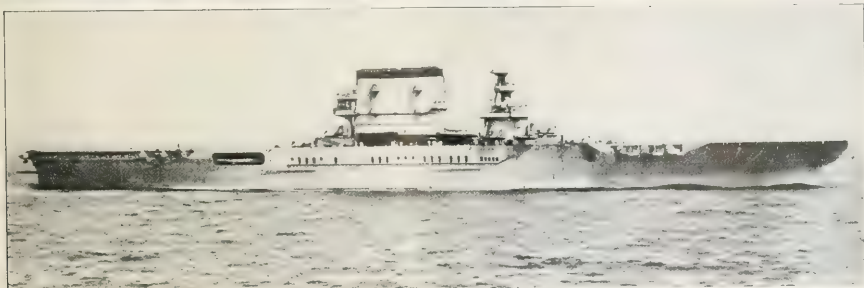
powers exceeding 20,000 brake horsepower would be transmitted not by two but by four shafts. But this does not mean that Sulzers consider 10,000 brake horsepower as the limit of output for a single-acting 2-cycle diesel engine. Whether single-acting or double-acting 2-cycle engines with direct drive, or high-speed engines with reduction gear, offer the greatest reliability for higher powers remains at present a debatable question.



Speedy Leviathans

At left, airplane view of the U.S. airplane carrier *Saratoga*. Below, broadside view of the U.S. airplane carrier *Lexington*. These two splendid additions to the United States Navy have demonstrated their ability to run faster than anything of their size afloat.

The General Electric Company and all other engineering concerns responsible for the functioning of these floating power plants are to be congratulated on their success.



Nawiliwili, the Latest Harbor of Hawaii

With a Glance at the Three Other Principal Ports of the Archipelago:
Honolulu, Hilo and Kahului

By Andrew Farrell

HAWAII proper comprises eight principal islands, seven of which are economically productive. Four of the seven, Hawaii, Maui, Oahu and Kauai, long ago were brought under intensive cultivation; and two others, Molokai and Lanai, which lagged agriculturally because they were unsuited to sugar cane, recently began to produce large crops of pineapples.

Sugar and pineapple, as was indicated in the preceding paragraph, are the principal crops of Hawaii. Both are produced in enormous quantities: the first supplies a large part of the Western United States; the second enjoys virtually a world monopoly in its field. Obviously both require adequate and uninterrupted marine transportation; almost as obviously the islands are buyers of well-nigh every conceivable product, especially from the continental United States. Enough has been said to suggest the vital consequence of shipping to Hawaii. Notwithstanding this, it is only now that Hawaii can be described as within striking distance of adequate port facilities, although the archipelago long has enjoyed excellent steamship service.

Such a state of affairs is not difficult of explanation. Geological conditions in general have not been favorable to the formation of harbors. The islands are no more than the upper portions of oceanic volcanic peaks, here savagely eroded, there retaining their pristine contours; relatively small, without any wide river valleys that might, through subsidence, have become natural harbors of any importance. It is, however, true that the streams of Hawaii, though of no

great size, have been instrumental in creating what harbors there are, since fresh water hinders or prevents the formation of coral, and consequently reefs are broken where any considerable stream enters the sea. Even so, coral is no small obstacle to development. Pearl Harbor, a fair-sized body of water, the only good natural harbor in all Hawaii, is yet a network of reefs; and extensive dredging has been and is being done in order to make it accessible to larger naval craft.

Happily for commercial Hawaii, the interests of the United States Navy, of national defense, ran on all fours with the interests of shipping. The Navy needed subsidiary harbors, especially for smaller vessels, a category to which seaplanes may now be added; business required ports; hence the federal government long ago embarked on a program of satisfying both needs at the same time. As the ports most worthy of development the government selected Hilo, on the eastern coast of the island of Hawaii; Kahului, on the northern coast of Maui; Honolulu, on the southern coast of Oahu; Nawiliwili, on the southeastern coast of Kauai. Honolulu and Kahului had been improved to greater or lesser extent prior to assumption of responsibility by the United States; projects in these harbors and in Hilo have now been under way for years, though not one is complete—Honolulu especially is making greater demands as traffic increases; but it is within the last nine years that Nawiliwili has begun to receive much attention; and not until January 1921, did actual work start. Nawiliwili therefore is

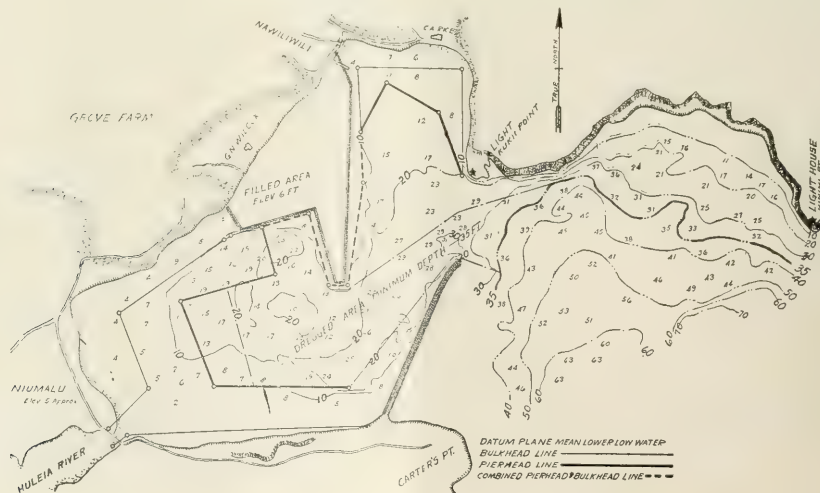


Chart of Nawiliwili harbor showing proposed improvements.

the latest of the commercial harbors of Hawaii, of the important commercial harbors; and it is also the last likely to be undertaken for many a year.

When Nawiliwili has been dredged and wharves have been built, Hawaii finally will possess a fairly satisfactory harbor system. In addition to the four principal ports named, another has been constructed for Lanai by the Hawaiian Pineapple Company, owner of the island; and improvements will be made to facilities of Molokai. That is not to say that lighters and boats no longer will be used, because the island of Oahu alone is now able to ship through one port, Honolulu; and a considerable volume of outbound and inbound freight, as well as passengers, will have to be handled at more or less exposed roadsteads. Nevertheless an old and interesting—and dangerous—feature of shipping Hawaii, the transportation of passengers and cargo in boats, has been decreased materially.

Nawiliwili Port

Nawiliwili is situated on the southeastern coast of Kauai, about 100 miles northwest of Honolulu. It is an inlet in a rugged shore, at the mouth of a small stream. Protection is afforded on the north by a rocky bank and on the south by high cliffs, the harbor is however, exposed to heavy seas kicked up by the northeast trades, the prevailing winds of Hawaii. To protect Nawiliwili from such seas a breakwater was necessary; its construction had to precede all other work. It was begun in January, 1921, and was completed in March, 1926. The wall is a rubble mound, 2150 feet long, divided into two parts, one of 1750 feet, the other, an arm turning slightly seaward, of 400 feet. Although the original plans provided for a straight wall, the United States Engineers decided that adequate protection would be provided by a shorter wall having a seaward bend. The whole extends from the south shore on a reef that separates the bay into an inner and an outer harbor. In the outer harbor the water is deep, notwithstanding a few shoals; in the inner harbor, behind the breakwater, much dredging will be necessary to deepen the basin to a minimum of 35 feet, the standard depth of the harbors of Hawaii. This basin will be about 1200 feet wide and 2000 long; the entrance channel, 35 feet deep, will have a minimum width of 400 feet and a length of 2400.

Through the channel, northward of the breakwater, seas of some force continue to roll. In order to provide additional protection, and also to make land for

terminals, railway tracks and so on, the territory of Hawaii has erected a retaining wall of stone, which incloses an area of about fifty acres, into which dredging spoil will be pumped. This wall was completed in June, 1928; the completion of dredging remains somewhat remote, as work is not expected to begin until October, 1928. A first unit will be done by the Hawaiian Dredging Company, of Honolulu, under contract; a second unit by the United States Engineers with their own dredge. The dredging company will deepen a basin, 600 feet square, south of the retaining wall, to 35 feet, and also will deepen the entrance channel to 20 feet, so that the large dredge of the engineers will have access to the harbor. All this dredging is estimated at 2,400,000 cubic yards; hence the federal government's portion of the work is only about one-third completed. Kauai is exceedingly desirous that dredging begin promptly, since there is fear that the retaining wall, containing 93,000 tons of stone and erected at a cost of about \$300,000, might be seriously damaged if left unsupported too long. The breakwater itself has suffered damage and well may suffer more, though it could be given much protection if a fore-shore were built up of dredgings, which would break the first impact of rollers. Notwithstanding the urgency of filling the retaining wall, sufficient dredging spoil is not in prospect under existing plans, inasmuch as a change in the extent of the wall increased the area of land to be filled. This shortage could be remedied, however, by increasing the amount to be dredged by the Hawaiian Dredging Company, the additional work to be paid for by the territory, or by sending to Hawaii a government dredge equipped for pumping spoil behind the wall.

Federal Aid

Up to June 30, 1927, the federal government had spent \$724,576 on Nawiliwili, in addition to \$200,000 contributed to the government by the county of Kauai, which was afterward reimbursed by the territory. Work to be done by the Hawaiian Dredging Company will cost \$294,000, besides \$21,000 for administration; and the United States Engineers estimate that an additional \$1,131,000 will be required for the completion of the federal government's portion of the work. Then the territory of Hawaii, which already has spent \$200,000 as a contribution toward construction of the breakwater and \$300,000 for the retaining wall, will spend probably another million dollars on port facilities.



Nawiliwili harbor, island of Kauai, Hawaii, from 3000 feet in the air.

In the left central foreground may be seen the breakwater; and above it the partly completed retaining wall. The light colored vegetation surrounding the harbor is sugar cane.

Photo by 11th Photo Section, A. I. Service, U. S. Army.



Down-town Honolulu and harbor, from 1000 feet in the air.

The massive block surmounted by a tower at right center is composed of Piers 8, 9, 10 and 11, all new.

In the upper right may be seen a dredged portion of the "reserved channel" leading to Kapalama Basin.

Pearl Harbor lies beyond the upper right edge of the photograph.

Photo No. 11th Photo Section,
A. F. STUBBS, U. S. ARMY

Years must pass before all this can be accomplished. Building harbors in Hawaii is obviously both slow and expensive. The people of San Francisco do not know how fortunate they are in having such a magnificent natural harbor.

To a layman it appears that Nawiliwili will be fully the equal of Honolulu harbor; perhaps better, certainly relatively better, since it will not be so crowded. Furthermore Nawiliwili could be used by all the principal shippers of Kauai, in this respect paralleling Honolulu, which as was said, serves all Oahu. Persons unfamiliar with Hawaii may think it strange that one small island requires several ports; that is, however, the fact. It arises from the topography of the islands, which are quite mountainous and so make railroad and highway construction expensive. On the other hand Nawiliwili will not be necessarily used by all interests, inasmuch as large sums have been spent by corporations on Ahukini, which lies near Nawiliwili, and on Port Allen, which is situated on the southwestern coast of the island. These two ports, neither at all good, neither passably satisfactory, offered serious obstacles to the development of Nawiliwili; even after the federal government had expended much money, much opposition to the new harbor manifested itself. Some of this opposition was open; more of it was secret, and appeared principally in the form of extraordinary backing and filling by the territorial board of harbor commissioners. Thanks, however, to the vigorous policy of the Kauai Chamber of Commerce, supported by the newspapers and by some officials of the territory, attempts to prevent completion of the work failed, and it appears that nothing now can defeat Nawiliwili.

Two Rival Ports

Both Ahukini and Port Allen were developed by sugar companies primarily for the dispatch of their own cargoes, although both are used for other business. Naturally, so long as no governmental agency interested itself in providing Kauai with a good harbor, private interests were thrown on their own resources; and it is not surprising that ports other than Nawiliwili should have come into existence. Port Allen, indeed, indirectly and remotely assisted in the development of Nawiliwili, inasmuch as a request for

a federal appropriation for Port Allen, or Hanapepe, to use its Hawaiian geographical name, led to a survey of the entire coast of Kauai in 1911. In consequence of this and of other investigations Nawiliwili was recommended as most worthy of improvement; work was deferred, however; and no appropriation was made until 1919.

Port of Ahukini

For many years Ahukini had been put to some use by a sugar plantation. But that corporation, under its former German ownership and management, was not blind to the inherent disadvantages of Ahukini; and it loyally supported Nawiliwili, making engagements of such nature that the plantation, as such, notwithstanding a change in ownership, remains committed to Nawiliwili, and may be relied upon to fulfill its pledges to build railroad tracks to the new port. Unhappily, however, somewhat extensive work was done by a new corporation on Ahukini after the war had dispossessed the Germans: a short breakwater was constructed, a larger wharf was built; and this despite the prior selection of Nawiliwili by the federal government. This expenditure at Ahukini was decidedly unfortunate. That the harbor could not be satisfactory was obvious to the most inexperienced eye: the United States Engineers had reported years before that a good harbor for inter-island traffic could be made at Ahukini, or Hanamaulu, as it was formerly known; but that the construction of a harbor for ocean liners was not practicable. And nothing less than direct communicate with the mainland, direct dispatch and receipt of goods, will satisfy the legitimate aspirations of the islands. They have grown weary, and justly, of paying tribute to Honolulu on every pound of freight. Steamship companies, on the other hand, notably the Matson Navigation Company, the premier carrier in Hawaii-Pacific Coast trade, are quite willing to send their vessels to any good harbor where freight offers. Ahukini today is cramped; and it has reached the limit of feasible development. Ocean-going vessels of the larger size cannot use it; the place is exposed to northerly seas and winds, although the breakwater does afford protection against seas from the northeast; entrance and exit are difficult; mooring is slow and clumsy; and only one vessel can berth at a time.

Hence steamers of the Matson Line, loading for San Francisco, and vessels of the Inter-Island Steam Navigation Company, handling Honolulu cargo, frequently trample on each other's toes. It is not uncommon for a Matson vessel to be compelled to quit the harbor to make room for an Inter-Island steamer carrying mail and passengers. In consequence the Matson Line formerly made a surcharge of 50 cents a ton for general freight and \$2 a thousand feet for lumber, these charges in 1924 amounting to about \$27,500. With the 1928 sugar crop, however, they were discontinued. More-over direct shipments from the Pacific Coast to Ahukini were rare until recently; and the consequential handling charges at Honolulu, freight from Honolulu to Ahukini and port charges at Ahukini have been approximately as much as the San Francisco-Honolulu freight rates. This excess cost in 1924 was about \$105,000. It is no wonder that Kauai has demanded the improvement of Nawiliwili.

Port Allen

Port Allen is even more unsatisfactory than Ahukini. All cargoes are handled by boats or lighters to vessels moored in a partially protected roadstead, and port charges are necessarily high, although direct shipments from the Pacific Coast are received. The place is exposed to southerly gales, which not infrequently sweep the islands in winter. In the winter of 1915-1916, in fact, two sailing vessels were lost at Port Allen within two weeks, while another escaped by the skin of her teeth. Nevertheless Port Allen has enjoyed the same freight rates as are granted to Honolulu; in 1927 the harbor was visited by 109 steamers; 70,780 tons of cargo was shipped to San Francisco, and 50,000 tons was received. It is Port Allen, and not Ahukini, that may offer competition to Nawiliwili.

In view of all circumstances, however, it appears quite probable that eventually most or all the sugar and canned pineapple of Kauai, as well as most of the inbound freight, will move through Nawiliwili. Steamship companies well might bring that about. The attitude of the principal line engaged in Hawaiian business, the Matson Company, was stated in 1924 by E. D. Tenney, then president: "I would think that all interests on Kauai might with advantage unite to make this magnificent harbor their common shipping port after the breakwater is completed and the inner harbor is dredged as planned." Efficient handling of vessels

at Nawiliwili, as compared with Port Allen, would save shipowners many thousands of dollars a year.

In the rivers and harbors act of 1919 Congress provided that no work should begin on Nawiliwili until the secretary of war was satisfied that railroad connections would be made between Nawiliwili and "the entire southern portion of the island." Some connections have already been made, linking the rails of the different plantations; and the final line to Nawiliwili is assured. If a stream were bridged, every plantation of the island, one small plantation excepted, would be connected with Nawiliwili by rail. If that were done the situation would strikingly parallel that obtaining on Oahu, all the plantations of which, one excepted ship to Honolulu by the Oahu Railway, and that one trucks its sugar overland, as the exception on Kauai is now doing.

Two Wharves Planned

To handle this business, some certain, some probable, the Kauai Chamber of Commerce is considering a plan, and may recommend it to the board of harbor commissioners, for two wharves at right angles to each other on the northern and eastern sides of the 600-foot basin already mentioned in the discussion of the dredging. One wharf, on the north, would be 600 feet long, with a dock shed 75 feet by 600; the other would be 850 feet long, with the southern 250 feet of this given over to lumber cargoes, and this wharf would have a dock shed 75 feet by 600 and a sugar warehouse 100 feet by 600. Cargo-handling machinery will, of course, be required, a fact that manufacturers might bear in mind.

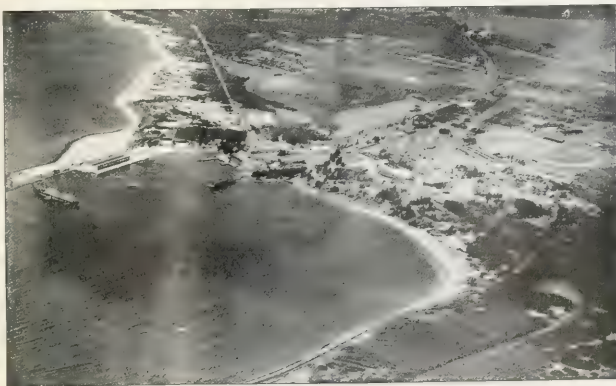
The facilities would, it is believed, be sufficient for all cargo likely to move through Nawiliwili in the immediate future. On the basis of the latest statistics then available, Francis E. (Drydock) Smith, consulting engineer, estimated in 1925 that Nawiliwili would have 57,293 tons of outgoing sugar and 6250 tons of pineapple annually, a total of 63,543 tons; and that incoming cargo would amount to 28,000 tons, besides 2,000,000 board feet of lumber. "It is anticipated," he added, "that there will be at least 10 per cent yearly increase in outgoing and incoming cargo over the next few years." This estimate appears quite conservative, both as to the volume of freight and the probable increase, since Mr. Smith assumed that Port Allen would retain

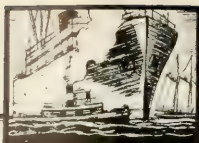
(Continued on Page 19 Blue Section)

Aerial view of Kahului harbor on the Island of Maui, Hawaii, as seen from an elevation of 2000 feet.

In the left center is shown a portion of the east breakwater and of the older wharves. The smaller wharf has been replaced by a new concrete structure since this photograph was taken.

Photo by 11th Photo Section
Air Service, U.S. Army





Trade, Traffic, and Shipping

Freight and Passenger Traffic Movement between the Orient and Pacific Coast or Atlantic Coast via the Panama Canal*

By Edgar M. Wilson, General Agent, Dollar Steamship Line.

OUR problem on the Pacific Coast is to take advantage of our closeness to the oriental markets and endeavor to stimulate a greater flow of this traffic through our ports. So far as imports for local consumption and exports from local industries are concerned, we should establish more and more industries on the Pacific Coast to consume in increasingly large quantities the raw materials from the Orient and, in turn, send our manufactured products to those lands which so eagerly await them. We have a tremendous advantage over our brethren beyond the Rockies in our nearness to these great oriental markets. We have cheap power, an abundance of competent man power, adequate transportation facilities—everything necessary for the successful operation of great industries. All that is necessary is to sell the products. Great strides have been made in the past decade, but much still remains to be done.

For traffic moving to or from Atlantic Coast ports and that interior territory which is contiguous to the Atlantic Coast, we have an entirely different problem, particularly on the imports. Manila is almost the half-way point in the Orient between Pacific Coast ports and the Atlantic Coast ports. In other words, the distance from Manila to New York, via the Panama Canal, is 11,546 nautical miles, while via the Suez Canal it is 11,556 miles, a difference of only 10 miles. Via San Francisco, however, and overland from there, the distance is only 9480 miles, and via Seattle, 9192 miles. As we get beyond Manila, the advantage naturally becomes increasingly greater in

favor of Suez—Singapore and Calcutta, for example, being considerably closer via Suez than via San Francisco or Seattle. On the other hand, Hongkong, China, and Japan are considerably closer via Panama than via Suez.

From the geographical position, then, it is but natural that traffic for Atlantic Coast ports and overland common points in the Atlantic territory from points in the Dutch East Indies, Straits Settlements, and India will flow through Suez; traffic from Hongkong, China, and Japan will move through Panama; while the Philippine Islands are the battle ground for both routes. The above, of course, is predicated upon adequate facilities.

The great bulk of oriental imports from the ports noted above consist of raw materials, raw sugar, copra, vegetable meals of various sorts, hemp, seeds, and the like. These must of necessity seek the cheapest route to their markets. Their intrinsic value being relatively small, time is of minor consideration; hence the traffic flows naturally by direct steamers through the Panama Canal where such a service is available for them. It is only where a short market with a corresponding increased demand develops (and that in turn acts to enhance the value of the products), or where adequate direct steamer facilities are not available, that we may reasonably hope to secure any appreciable volume of this traffic for transshipment through our ports. The situation has long been recognized by the steamship lines which have, for many years past, endeavored to encourage this traffic by providing lower ocean rates on many commodities transhipped through Pacific Coast ports than on the same commodities for local delivery, but the volume

of cheap commodities affected thereby has remained relatively small.

The same influences tend to direct the channels through which our low grade exports flow to the Orient. As an example, during the 1926-1927 season some 81,622 bales of Texas and Oklahoma cotton moved to the Orient through the Pacific Coast ports. During the 1927-1928 season but 1850 bales passed along the same route. The reason is simple. In the former season, Japan bought heavily and for quick delivery and time was an important factor. The beginning of the present season found Japan heavily stocked with American cotton; with the result that they had plenty to work on, time was no object, and the vast majority of Texas and Oklahoma cotton moved over the longer but cheaper route of Gulf ports rather than via the Pacific Coast.

There are, of course, many classes of commodities imported from the Orient whose value is such that they must find their way to their markets via the shortest possible route and in the least possible time. Silk and silk goods, cigars, tea, coffee, and spices, desiccated cocoanut, art works, curios, and the like form a class of goods on which the insurance, interest on the money invested, the condition of the market, and other circumstances allow them only one channel of travel, by fast steamer across the Pacific and fast freight across the continent. Some of them, such as silk, even command precedence over mail and passenger trains across the United States.

The opening of the Panama Canal has had a tremendous influence on the amount of tonnage to and from the Orient passing through our ports. Ignoring, if you please, its effect upon the movement of low

*Abstracted from the report of the American Pacific Coast Shipping Conference, 1928.

priced commodities to and from the Orient to the Atlantic Coast and its stimulating effect upon water-borne intercoastal business, the shortening by some 6000 miles of the direct water route and the elimination of the dangerous routes around the Horn or through the Straits of Magellan must be reflected in the transhipment routes. Two years ago tonnage passing through the Panama Canal exceeded that of the Suez Canal by 2,000,000 tons.

In passenger movement to and from the Orient (aside from the development of the Dollar Line Round-the-World Service, and the stimulation given to the private cruise idea), the Panama Canal has had but little effect. The average person, all things being equal, prefers to travel by the shortest route between two points. Likewise, it has been found almost impossible to divert much of the Oriental-European business via America. Some years ago, the transpacific passenger lines adopted a very low rate of \$120 from Oriental ports to Europe via the United States. The

Suez lines immediately reduced their rates to £100 and the traffic went back to its natural channel, through Suez. Today a conservative estimate of this traffic through Pacific Coast ports would probably not exceed 500 passengers annually.

While the total passenger movement to and from Pacific Coast ports has shown a small increase in recent years, it has been so small as to be negligible. For example, during 1921, transpacific steamers carried a total of 73,547 passengers of all classes to and from Pacific Coast ports while in 1927 the total was 75,158, an increase of 1600 in seven years. Of this number, 20,425 were first-class passengers in 1921 and 17,951 were first-class in 1927.

Contrast this with the half-million or more American tourists who annually make the pilgrimage to Europe and I think you will agree with me that here is a field where much can be done. A very large percentage of the first-class passengers noted above are traveling

on business or are missionaries, our tourist business or those traveling purely for pleasure being lamentably small. For years it has been thought the proper thing to "do" Europe, and hundreds of thousands of our citizens are more familiar with European capitals than they are with their own country. Let us endeavor to induce a part, at least, of this immense pilgrimage to travel westward instead of eastward; for once we have them on our shores, it is comparatively easy to sell them the idea of Oceania and the Orient.

Hand in hand with the increase of tourist travel across the Pacific would march an increase of our foreign trade with those countries across the sea. Familiarity breeds increased business; and just as surely as we increase our tourist trade, so surely will we increase our merchandise trade, through the increased purchasing power of our foreign friends, through increased prosperity, and the better understanding which must come through better acquaintance. That is inevitable.

Team Work in Foreign Trade

Sixth Annual Convention, Pacific Coast Foreign Trade Council, to be Held in Los Angeles

LEADING business interests of the Pacific Coast of the United States, Western Canada and the West Coast and border States of Mexico will gather together for the Sixth Annual Convention of the Pacific Coast Foreign Trade Council to be held in Los Angeles September 18-19-20.

Preliminary call of the Convention has just been issued by Wm. Pigott, of Seattle, President of the Council, to all Chambers of Commerce and trade organizations at principal ports extending from Vancouver, B.C., on the north to Manzanillo, Mexico, on the south, the Hawaiian Islands, and El Paso, Texas, to the east.

"Team work in Foreign Trade" has been designated as the key note of the Los Angeles Convention. Around this theme prominent business leaders of the Pacific Coast are being drawn upon for the preparation of a program in which shipping and trade problems peculiar to the Pacific Coast will be presented with a view of bringing about closer cooperation in advancing the interests of this territory in world trade.

Export possibilities of the Pacific Coast, aviation and its potentialities in foreign trade, trade pioneering through motion pictures, farm relief via export trade, influences of the Panama and Suez Canals on Pacific Coast trade, and varied transportation needs of the Pacific Coast will be among many of the subjects to be featured in the three-day sessions.

Speakers before the convention will include Wm. H. Pigott, President of the Pacific Coast Foreign Trade Council, and its guiding spirit since its organization seven years ago; Wm. P. McCracken, Assistant Secretary of Commerce in charge of Aeronautics; John H. Rossiter, formerly Pacific Coast Manager for W.R. Grace & Co., F. N. Puente, General Agent in San Francisco for the Mexican National Railways; and Capt. S. S. Sandberg, recent appointee from Los Angeles to the United States Shipping Board; and a number of other trade and shipping leaders.

Particular interest will be attached to a motion picture session which will be in the form of a banquet on the evening of September

19, with Douglas Fairbanks scheduled as Chairman, and other important motion picture producing executives participating.

This will be the first occasion in which Los Angeles has had opportunity to sponsor this Pacific Coast Foreign Trade gathering, previous conventions having been held at Seattle, Tacoma, Portland, San Francisco and last year at Victoria, B. C.

Officials of the Pacific Foreign Trade Council are as follows:

President, William Pigott, Seattle, Vice-President Pacific Coast Steel Co.

Senior Vice-President, J. A. H. Kerr, Los Angeles, Vice-President, Security Trust & Savings Bank.

Vice-President, J. J. Donovan, Bellingham, Vice-President Bloedel-Donovan Lumber Mills.

Vice-President, Paul Shoup, San Francisco, Vice-President, Southern Pacific Railway Co.

Vice-President, R. B. Wilcox, Portland, President, Wilcox-Hayes Co.

Treasurer, J. A. Swallow, Seattle, Chairman Board of Directors, Dexter Horton National Bank.

[Department continued on Page 13, Blue Section]

The Diesel Auto Ferry Bainbridge

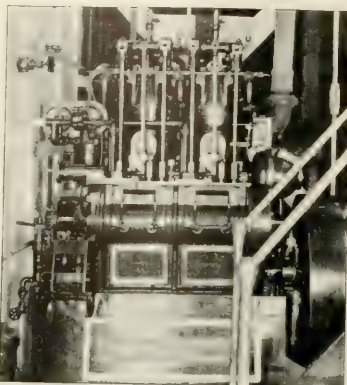
ON June 21 the Lake Washington Shipyards, Houghton, Washington, delivered to the Kitsap County Transportation Company of Seattle the double-ended auto and passenger ferryboat Bainbridge. This vessel had been put through a trial run and complete machinery tests on the day of her delivery and had proved a complete success in every way.

The Bainbridge is constructed entirely of Douglas fir. She is 187 feet 8 inches long overall, has a molded beam of 57 feet 8 inches, and a molded depth of 16 feet. She will carry 90 automobiles and 1000 passengers. Her regular run is between Seattle and Port Blakely, a little over 14 miles per round trip.

On her regular schedule for this run she is averaging 11½ knots an hour.

The main power plant on the Bainbridge consists of one Washington-Estep 4-cycle, non-reversing, medium compression, solid injection, 8-cylinder marine diesel engine, fitted with clutches at each end and driving through these clutches a right-hand screw propeller at one end of the vessel and a left-hand screw propeller at the other end. The cylinders of this engine are 17-inch bore by 24-inch stroke and develop 100 brake horsepower, giving a total brake horsepower of 800 for the engine at 190-200 revolutions a minute. The clutches are interconnected through the operating mechanism, so that as one is thrown in the other is thrown out. This system was thoroughly tested by the Kitsap Transportation Company on its ferry Kitsap, which has given perfect service for three years. On some river ferries in California the system has been in operation with perfect success for many years. On both the Kitsap, with 600-horsepower, and the Bainbridge, with 800-horsepower, the Washington-Estep diesel has demonstrated its ability to drive at 40 to 50 revolutions in maneuvering for landings.

Four-bladed propellers are used, 99 inches diameter by 78 inches



This neat 2-cylinder Washington-Estep diesel, direct-connected to a Westinghouse 25-kilowatt generator, provides electric light and power for the ferryboat Bainbridge

pitch. These were designed and made by the Coolidge Propeller Company of Seattle.

For lighting and auxiliary power, there is installed a 2-cylinder, 8½ by 10-inch, 450 revolutions a minute Washington-Estep diesel engine, direct-connected to a 25-kilowatt, 115-volt, compound-wound, direct

current Westinghouse electric generator, mounted on common sub-base, making a complete self-contained unit. This unit furnishes all electricity used aboard the vessel for lighting, cooking, and driving the various electric motors hooked up to the other auxiliaries.

In addition to this 25-kilowatt generator, there is a 5-kilowatt, 115-volt, compound-wound, direct current Westinghouse electric generator mounted on heavy rigid brackets attached to the main engine and driven off the engine flywheel with a leather belt and idler pulley.

For bilge service, a Moran bilge pump, centrifugal type, 2½ inches discharge and 3 inches section, with 350 gallons per minute capacity at 20-foot head, is direct-connected to a 5-horsepower Westinghouse direct current motor. The fire pump is a Moran 2-stage centrifugal, 3 inches discharge, 4 inches suction, high pressure, brass fitted, and driven by a direct-connected 25-horsepower Westinghouse direct-current motor turning 1750 revolutions per minute. This pump has a capacity of 200 gallons per minute at pressure of about 100 pounds. Both of these pumps were supplied by the Moran Manufacturing Company of Seattle.

The vessel is equipped with 90 cells of B6H Edison batteries which



The diesel ferry Bainbridge coming through the Lake Union ship canal, Seattle.

are wired so that they charge continuously off the generator mounted on the main engine and are automatically cut out when the main engine generator falls off in speed.

The sanitary unit is a motor driven gear pump, with a capacity of 6000 gallons per hour and having automatic tank control, piped to a suitable sanitary tank, of about 300 gallons capacity which is placed on the hurricane deck. This pump starts and stops on a variation of pressure of 10 to 20 pounds. For fresh water a Delco Light fresh water pump unit outfit, model 104 is in service. This is piped to the fresh water tank located in the hold and from the tank to the various fresh water outlets on deck.

For heating the vessel, a low pressure steam system is provided. This consists of one Ideal sectional cast iron boiler equipped with an automatic Dual oil burner, the boiler having a capacity of about 1200 square feet of radiation. There is a metal drip tray under the boiler with the edge turned up 4 inches all around and welded corners. Under this drip pan there is a layer of brick, with a sheet of 1/4-inch asbestos mill board between the brick and pan.

A very elaborate switchboard panel is provided which is up to date in every way. It contains voltmeters, ammeters, specially designed automatic battery charging and discharging series parallel switch, and an automatic generator no-voltage release. This switchboard was Washington-Estep special muffler



New service station recently erected at Terminal Island, Los Angeles harbor, by W. H. Worden & Co., California distributors for Washington-Estep diesel engines, to take care of installation work and service work on the Washington-Estep diesel of the Southern California workboat and fishing boat fleet. A similar station is established in the boat building center of Sausalito on San Francisco Bay.

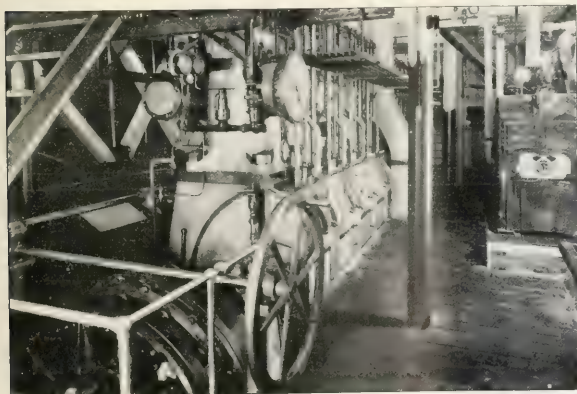
Marine Electric Company of Seattle, which installed the power circuits.

The exhaust is quieted by a designed and manufactured by the Washington Iron Works, builders of the main and auxiliary power plants. This muffler is mounted on suitable brackets and is located in the stack. The main exhaust pipe, which is led from the center of the exhaust manifold to the muffler, is covered with metal lath and asbestos up to the main deck level.

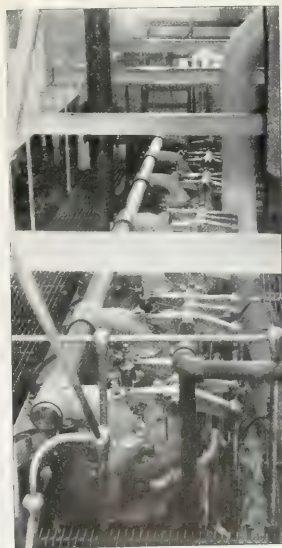
The ferryboat is equipped with a De Laval No. 302 oil purifier. This centrifuge has a capacity of 60 gal-
lons per hour and is connected up

so that it operates continuously between the lubricating oil strainer tank and the engine sump.

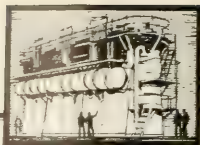
The Bainbridge is said to be the largest single-engined diesel ferryboat ever built in this or any other country.



Operating stand on the ferry Bainbridge showing one end of the 8-cylinder Washington-Estep diesel engine and one of the clutches.



Upper platform in the engine room of the Bainbridge, showing cylinder heads and valve gear of Washington-Estep diesel.



In the Engine Room

Mechanics For Marine Engineers

A Series of Practical Talks on First Principles

By A. L. Becker

THE granting of an original marine engineers license by the U. S. Department of Commerce, Steamboat Inspection Service, is contingent upon qualifications and requirements stated in the General Rules and Regulations prescribed by the Board of Supervising Inspectors.

In these rules it is required that the applicant have previous practical experience in the engineering department aboard ships, the amount of such required experience is to be governed by the applicant's previous mechanical or technical training. The foregoing qualifications being satisfactory, the applicant is entitled to an examination in writing. Such examination consists of questions relating to the adjustments of equipment, maintenance and care of machinery, emergency expedients and other queries, intended to determine the applicant's worthiness.

The above rules and regulations also provide that no original license will be granted unless the applicant can determine the weight necessary to be placed upon a lever safety valve for a given steam pressure when all other particulars of the lever safety valve are given. Also the applicant must determine the strain brought upon the braces of a boiler under a given steam pressure. Furthermore, an applicant shall not be granted a license who cannot read and write and does not understand the plain rules of arithmetic. The arithmetical questions are therefore incorporated in all examinations for original marine engineers license.

Apparently it is the desire of the Board of Supervising Inspectors, that licensed marine engineers become familiar with the type of problems illustrated by the lever safety valve, the boiler brace, etc.,

Here is a series of articles written by a practical marine engineer for the purpose of making more practical and useful the studies of operating marine engineers in preparing themselves to take examinations for higher ratings before the Board of Steamboat Inspection Service.

Mr. Becker will welcome all questions and special problems and will publish the solutions in these columns of Pacific Marine Review.

rather than the solution of a particular problem. Accordingly it appears that the rules should be clarified in this respect by citing references to publications, treating the subject in a simple manner or devote an additional space in the book of rules to cover the subject in a manner similar to the treatment given the design of boilers and their attachments. Boilers, engines, auxiliaries and ships are designed by engineers who should be, and generally are, familiar with the laws of mechanics, and it appears consistent to assume that the officers in charge of ship's equipment should have sufficient training in mechanics to handle the equipment efficiently.

There is no more justification of parting a line, a pennant of the cargo handling gear, a sling, or straining the ship by improper ballasting or loading, than there is in bursting a boiler to determine that it was not properly built. This does not imply that the necessary time should be consumed to make an analysis of each operation aboard ship as it develops. It does, however, desire to convey the fact that the operating personnel famil-

iar with the laws of mechanics and the ability to make analysis of conditions, will quickly recognize violations of mechanics in the operation of the equipment, and correct these errors before life is endangered and property is damaged.

Prospective marine engineers usually provide themselves with hand books which give rules for solving particular problems which may be requested by the examining board, or are equipped with lists of questions and answers, which are generally committed to memory in anticipation of the examination.

The engineer has very little, if any, use for the results of his accomplishment in calculating, as his ship does not have one of the type of safety valves to which his knowledge applies. The boiler braces and steam pressures have already been accepted and approved by proper officials, and the engineer has no misgivings as to the safety of this equipment as their use is limited to one fixed purpose. The result is that this preparation is of little value to the applicant beyond the point of his objective, the acquiring of a license, and therefore, is generally lost for want of application.

The principles employed in the solution of the safety valve problem are the foundation for the solution of all engineering or mechanical problems to which these principles apply, and therefore, a thorough understanding of these primary or basic principles will enable the engineer to determine accurately the strains or stresses in many devices used in the engine room, or on deck, such as:

The size of bolt to use in fulcrum of the lever safety valve, the compressive stress in the connecting rod and consequently the pressures on the crosshead pins and crank pins

due to the angularity of the connecting rod.

The variation in pressure on the crosshead guide, the center of pressure on the main journals of each crank and the distribution of this pressure for a complete revolution of the engine.

The strain on a sling compared to the weight lifted when removing the low-pressure cylinder cover, or other part of the engine.

The pull exerted by a winch, capstan or windlass when the working pressure is assumed and consequently the proper adjustment of the reducing

valve to prevent over straining the deck equipment.

The strain in cargo handling gear in such parts as cargo falls, spreaders, topping lifts, masts, booms and pennant when the pull of the cargo winch is known.

An intelligent interpretation of characteristic ship's curves, furnished by the shipbuilder with each vessel, to determine the trim, the effect on draft of ballasting, the transverse, and also the longitudinal stability.

This information is put in the hands of officers with the intention of assisting them in conserving property of the

owner and the cargo carried.

The above and many other similar determinations may be made by the engineer or the deck officer without further mathematical training than that derived from the common principles and rules of arithmetic.

The owners, marine superintendents, port engineers, and underwriters will appreciate that if the personnel, officers and apprentices are interested in their profession to the extent of applying the principal safety valve rules in their routine duties, operating costs will be materially reduced, better dispatch will be given vessels and accidents will be largely avoided.

The Chief Carries On

We have had many requests from operating engineers for practical stories describing emergency repairs at sea. We publish below two very good stories of this type and will, from time to time, publish others.

We would greatly welcome free discussion of this material and the actual experiences of other engineers. Experience is said to be the best teacher; but very few people are able to get the most out of their own experience without discussing that experience with others in the same line of work.

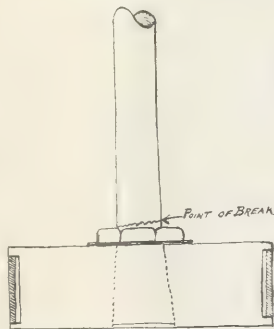
This Davit was a Real Life-Saver

THE steamer American Star of the Nelson Steamship Company was steaming through the Caribbean in fine style on a voyage from Norfolk to San Francisco, when all at once the air pump piston rod broke, practically crippling the engines. Of course it might have been possible to go on at a very much reduced speed and at sacrifice of much fuel, but Chief Engineer Richard J. Shields, a young man and a native of California, was not willing to do this, and at once got busy to make a permanent repair.

Fortunately the vessel was fitted with a good lathe, and the engineers, like most of the present day men, knew how to run it. Mr. Shields turned out the below watches and had the air pump stripped, when it was found that the rod had broken flush with the top of the bucket. The rod had a tapered head fitting a taper bore in the bucket, to which it was drawn snug by a nut threaded to the rod at the top of the bucket.

The break had occurred immediately above this nut, as indicated in the sketch. There was not a piece of three-inch steel bar of proper length in the engine room department; neither was a spare rod car-

ried, as such a break is very uncommon. However, the engineer was not stuck for he knew that boat davits are made of good material, so he got in touch with the captain and had one of the boat davits unshipped, laid on the deck, and two hands with hacksaws started to cut out from the straight part a length with which to make a new rod.



Diagrammatic sketch showing break in air pump rod. It will be noted, by comparing this rough sketch with the finished drawing on Page 420 that the nut shown should be countersunk into the piston.

Meantime others had begun to clear the bucket of the broken part and to take out from the yoke the rod connecting with it. The lathe was made ready, measurements were taken, and with the piece of davit in the centers things began to hum. That lathe was driven "to a fare-you-well," and splendid time was made, for inside of three hours the new rod was completed, in its place, and main engines going again, with the Chief reporting to the Captain that all was O.K.

The American Star made San Francisco with no further trouble. On inspection of the repair by Ray Gonzel, marine superintendent, he was so well satisfied with it that the pump was closed up again and the steamer allowed to make her northern ports while a new bronze rod was being made. On return to San Francisco the new rod was installed and the home-made one kept for spare, it being perfectly all right for that purpose.

This incident shows how a thinking man can save much money, besides getting himself out of a jam in time of stress. It also proves the soundness of the policy of having machine tools on board ship, for, had the American Star not been fitted with a lathe, it would have been practically impossible to have made this repair.

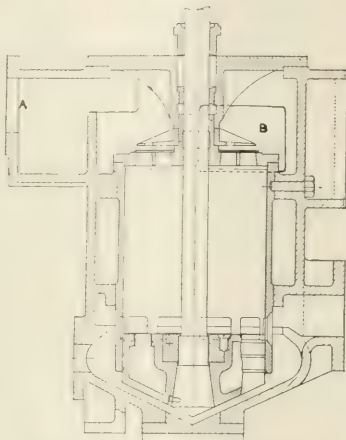
Finding A Lost Vacuum

A certain steamer operating out of San Francisco had given, since she was built by a well-known local yard, considerable trouble to her engineers because her air pump would not hold sufficient vacuum to make for economic operation of her triple expansion engines. For several seasons she operated unable to hold up more than 23 inches of vacuum, and with a considerable turnover of engineering personnel, who had been instructed by their superintendent to find out what was the trouble and had left her puzzled and absolutely beaten in their fruitless efforts to find and remedy this trouble.

This steamer had an Edwards air pump of the displacement type, fitted with head valves only. Other steamers with precisely similar condenser and air pump equipment easily held their vacuums up to 26 and 27 inches. It was thought that on the vessel in question there must be porous castings either in the exhaust column, the low pressure cylinder, or the air pump cylinder, but on subjecting these parts to hydrostatic tests no leaks developed. Here was a mystery! The superintending engineer gave the matter much thought, but could find no solution until Chief Engineer E. C. Matheson assumed charge in that engine room. On her first trip across to the Orient under charge of Mr. Matheson, he began a very systematic survey of all of the connections and arrangements and attachments pertaining to the condenser and the air pump.

The Edwards type of air pump has several inspection ports, located around the upper end of the air pump cylinder. These are closed and made tight by the regulation blank plates, fastened by studs. The bottoms of these inspection ports are a little below the level of the seats for the head valves of the air pump. The eduction pipe flange on this pump is placed at a sufficient height so that there shall be at all times an inch or more of water over the valves, thus making a water seal for the air pump.

Mr. Matheson found in his sur-



Section of an Edwards type air pump showing, at A, the connection for the eduction pipe and, at B, an inspection port.

vey that apparently because of the awkward position of this flange in this particular installation the mechanic who had installed the job had used one of the inspection ports as a connection for his eduction pipe to the hot well, and thus had eliminated water seal on the valves. Mr. Matheson decided that he would check this idea and so as soon as the vessel had reached port he immediately got off his inspection plates and found that his

theory was correct. Not wishing to run up any bills for new piping and changes until he was sure that he was right in practice as well as theory, he rigged up aboard ship a sheet iron pipe, riveted together, doped with red lead putty, wound with marline and canvas, and well painted. This pipe he installed with its connection at the proper eduction flange, and blanked up the inspection port from which the former eduction pipe had led. When the main engines were started up and the run for home began, the vacuum climbed up to 26 inches and stayed there throughout the trip. This of course made a big advantage in the way of mean effective pressure on the low pressure piston, with correspondingly good results in fuel consumption.

We may be sure that on his arrival home the young chief engineer could, like the ancient Greek scientist, shout "Eureka!" with pardonable pride. By a simple application of the rules of cause and effect he had solved a puzzle which for years had been bothering older and more experienced executives. Mr. Matheson, though a young man, is on the honor roll in efficiency and ability rating with the United States Shipping Board and is a marine engineer of more than the ordinary ability.

Pacific Marine Review hopes in the future to record many such instances of good sense and mechanical skill on the part of engine room personnel.

The Spotless Engine Room

IN a former issue of Pacific Marine Review, there appeared a description, with some illustrations, of the engine room of the U. S. Army Engineers dredge A. Mackenzie, that featured this room as being almost unnaturally clean. Since the article, as it appeared, had been under contemplation for some time, we naturally suspected that this engine room had been "dolled up" for the occasion. So the other day, we paid this big federal mud digging machine an unexpected visit, and much to our surprise we found that three more months of slinging mud had only produced a greater degree of polish on the machinery and on the room that it occupies.

The A. McKenzie is a diesel-electric dredge with three 1000-horsepower McIntosh & Seymour diesels, each driving a 700-kilowatt Westinghouse generator and two McIntosh & Seymour 250-horsepower diesel engines, each connected to a 150-kilowatt Westinghouse generator.

In February and March of 1927, the A. Mackenzie had her annual overhaul. Since that time she has been steadily at her business of dredging six days a week, with records as high as 45,000 cubic yards a day. Her engine room crew consists of four marine engineers, six oilers, and three wipers, headed by Chief Engineer John Martinson.

The writer, a member of Pacific

Marine Review's staff, and himself an old time marine engineer, was very agreeably surprised and charmed with the remarkable cleanliness and perfect order of every item in this power plant. Accompanied by Fred W. Schramm of the U. S. Army Engineers and Chief Engineer John Martinson, the writer made a thorough inspection of the engine room, pump room, store and tool room.

In the very completely equipped machine shop on the middle platform, we were much intrigued by a highly polished sheet copper top on the vise bench and a splash plate of copper on the bulkhead back of this bench. Inquiry developed an interesting story back of this piece of sheet metal. One day, sometime ago, considerable rattling and scraping developed in the dredging pump and there soon ap-

peared at the discharge end an obstruction, which proved to be a twisted and battered roll of pure sheet copper. On straightening this out it was found to be $\frac{1}{4}$ -inch thick and about 4 feet by 10 feet. It was polished and fitted to the bench top and the bulkhead at the back, being secured thereto with countersunk brass screws, and greatly enhances the cleanliness and neatness of the shop.

The condition of the engine room of this government dredge is very evidently due to the engineering training and artistic sense of Chief Engineer John Martinson, and to his ability for getting 100 per cent cooperation out of his engine room staff, so that they are always willing to keep their floating power plant spotlessly clean and 100 per cent efficient.

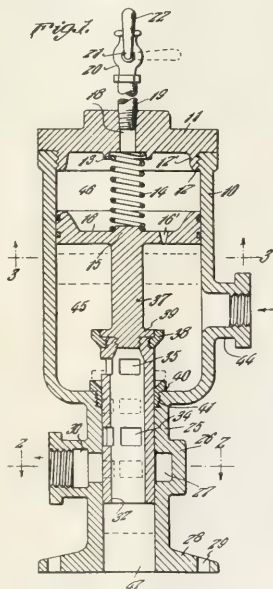
A New Pressure Ejection Valve

DIAGRAMMATIC illustration herewith shows a new type of valve recently patented by Claude C. Arrasmith and Harry D. Markwell, engineers of Seattle, Washington.

This valve is of the piston type and is operated by differential steam pressures and a spring. It is designed for the purpose of establishing pressure on fluid in a tank or pipe or other receptacle and especially for the purpose of operating by pressure the discharge of waste water from septic tanks below the water line of floating vessels.

Several of these valves are installed on the steamship President Grant and are working very successfully in every respect. They are taking care of the septic tank ejectors, the steam whistle, and the overspeed control valve on the main turbines.

As will be noted from the sketch, the valve is very simple. The casing has an enlarged portion provided at its upper end which is bored on its interior to provide a working fit for the upper portion of the piston, (16) in the drawing. This piston is held from upward movement by a spring (14) which fits between it and the cap. On the lower side of the piston is a tubular extension fitted with ports and acting as a piston valve. In the piston there is a small port (16'). When steam or other fluid under pressure enters the casing through connection (44), part of



Diagrammatic section through the body of a new pressure ejection valve designed and patented by Arrasmith and Markwell, marine engineers, of Seattle.

this fluid will pass through this port (16'), establishing a balance of pressure above and below the piston. If the pet cock in the cap

is opened, there is immediately an unbalancing of the pressures above and below the piston, inasmuch as the opening in the pet cock is much larger than the port through the piston; so that while the pet cock is open the piston is forced up, opening the piston valve below and allowing the fluid under pressure to pass downward and be discharged into the tank or pipe line through the connection (47). When the pet cock is closed the spring will seat the valve and the pressure be equalized above and below the piston. The arrangement of ports is such that when this condition exists the pressure in the pipe line, or tank, will be discharged again through (47) and (30). It is evident that the pet cock arrangement or any similar opening in the cap may be controlled from a distance through either electrical or mechanical means and that for any given installation the difference in the openings of the piston port and the pet cock and the strength of spring must be figured to suit the service.

The chief value of fitting lies in the simplicity of the valve itself. The one moving part is an integral assembly, easily manufactured and fitted and very easily replaced.

Trade Literature

Automatic Arc Welding by the Electronic Tornado Process. Starting improvements have been made recently in the automatic carbon arc method of welding which will account for almost unbelievable reductions in costs as well as vastly improved welds. The improvements are the result of a newly discovered method for controlling and localizing the heat of the electric arc. An entirely different method of welding is the result of the new process which is known as the "Electronic Tornado." All new principles involved in the new process were discovered and developed in the Research Department of The Lincoln Electric Company, Cleveland, Ohio.

A bulletin describing the new method welding in all its phases, including a treatise on the advantages of the use of the carbon electrode over the metallic electrode for automatic arc welding, has recently been issued by The Lincoln Electric Company. The text deals first with the greater strength and ductility and metal structure of the welds made by the new process. It continues with a description of the operation and a table showing the speed and costs.



Auxiliaries Ship Supplies Marine Equipment

Engineering Progress as Shown by Waialeale's Turbines

By I. Short, Marine Engineer, South Philadelphia Works,
Westinghouse Electric & Mfg. Company

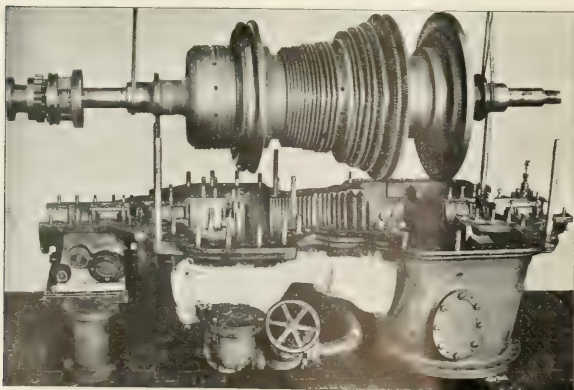
THE photographs which accompany this article illustrate some of the more important advances that have been made in the design and construction of Westinghouse marine geared turbines during the past ten years.

Figure 1 shows one of the 2000 shaft horsepower main turbines of the steamship *Waialeale*, which was placed in service in Hawaiian Island waters by the Inter Island Steam Navigation Company in June, 1928. Figure 2 shows a turbine of approximately the same size which was built in 1918. Both are of the complete expansion impulse-reaction type, the ahead impulse blades being visible at the left on each rotor, the astern impulse blades at the right, and the reaction blades in between.

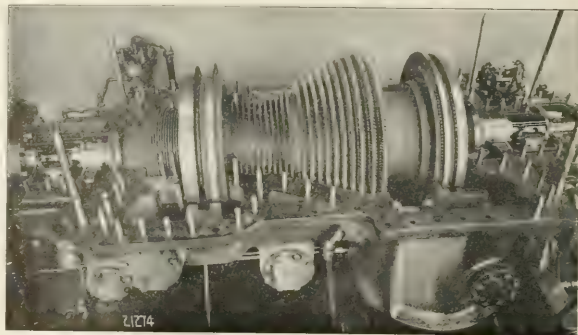
Changes in Impulse Blading

It is at once evident that the *Waialeale* impulse blades are much more massive than those of the older type. The chief advantage of this change is an improvement in overall turbine efficiency, but

greater resistance to steam erosion is also secured. Given clean steam and good operating conditions, the new impulse blades should not require renewal during the life of the ship.



A Westinghouse marine geared turbine of 1500 shaft horsepower built in 1918.



Westinghouse marine geared turbine, Type 1928, as installed in the Inter-Island Steamship Company's liner *Waialeale*. View shows this 2000 shaft horsepower turbine with upper half of casing removed.

Furthermore, a great mechanical strength in the impulse blades provides a very important factor of safety. It is possible to develop 50 per cent of the normal power of an impulse-reaction type turbine from the impulse blades without the reaction blades, and several ships have made port under these conditions. Hence the modern turbine has been so designed that, in event of bearing failure or other possible accident, the impulse blades would survive the destruction of the reaction blades, thereby preserving enough of the mechanism to make it possible for the ship to continue under her own power.

The *Waialeale*'s rotor shows two rows of astern impulse blades in place of the single row, with a steam-flow reversing chamber used on the 1918 type. This change is likewise in the direction of greater reliability and efficiency.

The Reaction Blade

The most striking feature of the *Waialeale*'s reaction blades as compared with those of the older model

is the uniform manner in which they increase in diameter. In other words, the cylinder and reaction blading have been machined conically, whereas earlier practice was to use a stepped or barrel design.

Obviously, a much smoother and more regular steam passage is provided by the newer form and among its practical results are: the elimination of steam eddies and water pockets, better steam expansion and materially improved efficiency without in any way sacrificing reliability.

Conspicuous in the actual turbine but discernible even in the photograph is the silvery luster of the Waialeale's blades. This is due to the use of stainless steel which, as shown by several years of research, imparts greater strength to the blades, improves their wearing qualities and retards depreciation of their efficiency. It also permits the use of high pressure-and-temperature steam, which is becoming general with land turbines and will, doubtlessly, in time be employed at sea. Manganese-copper, the earlier standard material for reaction blades, is now no longer used.

The Oil Governor

At the extreme right end of the shaft of the Waialeale's spindle, a small impeller can be seen which is a part of a newly developed governor. It rotates in a chamber filled with oil, and as it imparts a pressure to the oil which is a function of the turbine's speed, this pressure is used to control the steam supply to the turbine.

The mechanism of this governor is very simple. Fly balls, knife edges and parts in contact with steam are done away with; there is nothing that can wear or is liable to stick and nothing that rotates aft the impeller. It can be set to operate the turbine at any speed from 25 per cent to maximum; the setting can be changed at will and by remote control if desired; and the speed variation from the set value will not exceed 5 per cent. So sensitive and positive has this governor proved in practice, that the automatic overspeed trip is omitted as no longer useful.

Other Improvements

Among other recent improvements found in the Waialeale's turbine are:

The spindle is constructed of two pieces of forged steel instead of three steel castings.

The grooves of the dummy pis-

ton are cut very deep to allow for thermal distortion.

The coupling end of the turbine is supported on a flexible I-beam instead of upon sliding gibs which may rust and stick and cause buckling when the turbine expands on being warmed up.

Higher Efficiency, Greater Reliability

The water-gland ring is made of two pieces bolted together and easily renewable, in place of a solid piece shrunk on the shaft and renewable only by the removal of the spindle.

It is evident, therefore, that considerable progress has been made in marine turbine engineering during the past decade, and that the modern turbine is both more efficient and more reliable than the type of ten years ago. Its efficiency has, in fact, been raised to the point where its operating cost should be, in general, equal to, if not less than, that of any other comparable unit for ship propulsion; and with proper attention it can be depended upon to last as long as the ship it drives without major repairs.

Ellis System Barges

THREE large barges have recently been built under the Ellis Channel System of Steel Hull construction on the Pacific Coast.

The largest, costing approximately \$100,000, is the cable barge Pacific, owned by the Pacific Telephone & Telegraph Company of San Francisco. This craft will be used in laying, maintaining, and repairing submarine telephone and telegraph cables in San Francisco Bay, and elsewhere on the Pacific Coast.

The other two barges are for the Kamchatka Company, a Soviet Government organization. These will be used as fish carriers in Siberia, and have been shipped to their destination in sections. Due to the strength and simplicity of the Ellis method, shipping of hulls for export is an easy matter.

The Pacific Telephone and Tele-

graph Company barge, measuring 100 feet by 40 feet by 12 feet, is built entirely of 12-inch structural channel steel, riveted edge to edge. This barge has been equipped with a 25-ton derrick, and a cable reel which will hold 15,000 feet of four-inch cable. Both of these are driven by steam.

The Pacific carries an electric light plant and an electric arc welding plant. She also has commodious accommodations for from 35 to 40 men, including galley and mess room.

The Linde Air Products Company, 30 East 42nd Street, New York, N.Y., has recently issued a booklet entitled **Oxwelded Industrial Piping**, which describes and explains clearly the economies in construction, repair, and maintenance of oxwelded pipe systems and is profusely illustrated.



Ellis Channel System barge Pacific, built for the Pacific Telephone and Telegraph Company by Wallace Bridge and Structural Steel Co., Seattle.

Centrifugal Bilge Pumps

THE open impeller centrifugal pump is peculiarly adapted to the movement of slushy liquids and hence is ideal for handling the slush from a ship's bilges except for the fact that, as ordinarily constructed, this type of pump loses its suction with the presence of air in the pipes and puts the engineers to considerable bother in priming and repriming the apparatus.

In order to overcome this difficulty, the Nash Engineering Company of South Norwalk, Connecticut, has developed the Jennings Hytor suction type of centrifugal. This pump is built with a rotary air impeller mounted on the same shaft as the impeller of the centrifugal pump and working in a separate chamber of the casing. The suction for this air pump is taken from the top of a small cast stand pipe fitted with a float valve, the bottom of the stand pipe connecting through passages with the casing and suction pipe of the centrifugal pump. Thus while the pump is in motion a vacuum is maintained above the suction pipe which insures adequate priming of the centrifugal. Connected with the inlet pipe to the air pump is a small water pipe fitted with a drip feed, so that the rotor of the air pump is

constantly provided with a water seal.

A No. 3 Jennings Hytor suction centrifugal pump was installed recently on the U. S. Army Engineers dredge A. Mackenzie. This unit, driven by an electric motor at 1750 revolutions a minute, discharges 100 gallons a minute against a total head of 30 feet. It is lifting from the bilges at an average depth of 8 feet and will easily handle a 15-foot lift. As will be noted from the illustration herewith, the arrangement of the suction manifolds, the rose box, and the pump control is

very compact and handily arranged for operation. Chief Engineer John Martinson of the A. Mackenzie is very much pleased with the performance of this unit.

It is evident that with this installation it would be very easy to install automatic control for starting and stopping the pump; and it also will be evident that such an arrangement, combined with the automatic priming feature, would result in much greater economy of power than would be possible with any centrifugal pump which had to be primed by hand. The Nash Engineering Company is represented in San Francisco by Halloran and Pardee, engineers.

Fuel Wasted Up the Stack

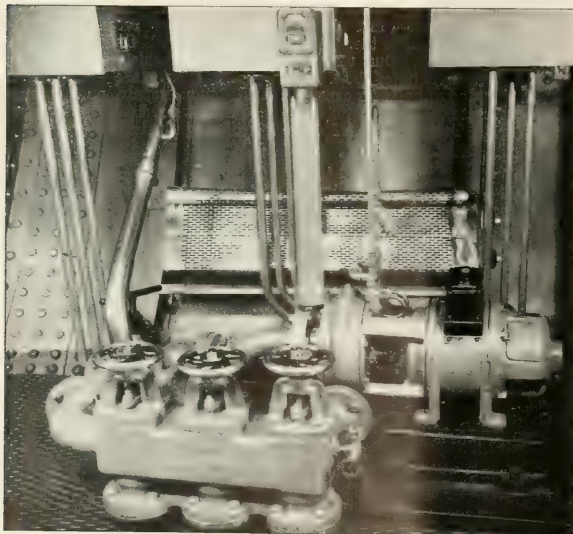
IN the average boiler plant, 35 per cent or more of the heat in fuel burned under the boilers is lost with the stack gases. This can be prevented with Apex carbon dioxide recorders which are today being used by the majority of fuel consumers throughout this country and abroad. There is only one best adjustment for the carburetor of your automobile. Too much air—or too little—wastes gasoline. So it is with your steam boilers. If your fireman does not proportion the air

supply just right at all times, you will surely waste a lot of fuel.

The electrically operated Apex carbon dioxide recorder and indicator, manufactured by the Uehling Instrument Co., Paterson, New Jersey, tells the fireman how to obtain correct air supply continuously, irrespective of changing load conditions of the boiler. They take the guesswork out of firing; thus enabling the fireman to produce more steam with less fuel, while at the same time lightening his labor.

One of the most serious and persistent of fuel wastes is caused by burnt-out spots in the fuel bed. These are detected quickly by the Apex instruments, enabling the fireman to cover them up and stop the waste. Likewise, it is practically impossible to maintain the correct thickness of fuel bed or the proper damper adjustments for the rate of driving, without the guidance of a carbon dioxide instrument. Air infiltration through cracks in the setting and through cracked or warped doors or other openings often chills a boiler to such an extent that the fuel bill is out of all proportion to the steam produced. Such adverse conditions are easily prevented because they are shown up in a very positive way by a marked reduction in the percentage of carbon dioxide recorded. Incorrect methods of firing and of cleaning fires give way to efficient methods when the fireman is provided with these simple guides.

The design of the Apex carbon dioxide instruments is based on more than thirty years of experience in this field. No expense has been spared in striving for maximum simplicity and convenience.



Jennings Hytor suction centrifugal bilge pump installed on the United States Army Engineers dredge A. Mackenzie.

Painting Ship Bottoms

By Bernard Hedstrom

THE object of this article is to bring before the attention of shipowners and operators a summary of facts relating to ship bottoms compositions, now in use, their constituents, modes of application, relative advantages, and protective qualities, as well as antifouling properties.

The writer has given close attention to this important subject for many years, and it is agreed that there has been considerable improvement in compositions and greater uniformity in results than formerly. We endorse the view that there is a necessity for care in the maintenance of quality, if the results of special trials are to be repeated in common practice. Chemical analysis as a test of quality is a good one, but there must be dependableness to a large extent on the integrity of the manufacturer; and there ought to be a close inspection and careful record of results if the greatest economy is to be realized. First cost of compositions is not the chief item for consideration.

Paints with the same antifouling properties do not always have the same capacity for retaining a smooth surface. The priming and protective coats, as well as the antifouling coat, should dry and harden quickly; and the last coat should be free from grittiness or hard lumps. A paint which has good antifouling properties but peels off when exposed to air and water is not good. On the other hand, even a smooth paint which is deficient in antifouling properties is practically useless except as a possible protection to the hull.

Before antifouling compositions had achieved the success which they now enjoy, instances were recorded of vessels on less than a year's service having barnacles over six inches long; but while such a growth seldom occurs now, the inevitable fouling which takes place under best conditions must seriously retard the steaming qualities of vessels of slow or moderate speeds.

The coefficients of friction for skin resistance assume clean-painted hulls, with the paint hard and smooth and free from grit. This is a condition of skin which does not usually last; and the growth of

vegetable matter and animal matter attached to the hull makes the surface much rougher and the coefficient of friction higher, with a consequent increase in the skin resistance and the horsepower necessary to overcome this resistance, or a diminution in the speed.

Then, if the condition of the bottom is such that the coefficient of friction is doubled, about 35 per cent more horsepower is required to obtain the same speed, or the speed is proportionately reduced.

For slow and moderated speeds, where the resistance is largely skin resistance, the effect of fouling is greatest; and assuming as before such a surface as will cause the frictional coefficient to be doubled, then the speed of an 11-knot vessel 400 feet long would be reduced at least 2 knots. It follows that fouling is more important at low, nonwave making speed than at high speeds.

It is difficult to define the effect of any degree of fouling; but many cases are on record of ships losing $\frac{1}{2}$ to 2 knots simply because of the foulness of their bottoms. An examination of Mr. Froude's plank results shows that even the roughness of calico nearly doubles the resistance, and it would require but little growth of weed or barnacle

to give worse conditions than calico. Experiments performed in the Spezia tank are stated to have shown that the resistance of a surface covered with incrustations is five times that of a freshly painted surface.

Fouling may be a vegetable growth, or it may be caused by shells. In the North Atlantic the fouling is almost entirely grasses; but in South African waters and in East, or in hot climates, barnacles are also formed; while in the United Kingdom vessels laid up for a period get covered with a growth of mussels.

Where pitting has occurred, the pitted parts should be thoroughly steel broomed and two coats of anticorrosive paint applied, and, when these have dried, the antifouling mixture can be applied.

There are various paint compositions in use which retard the growth of animal and vegetable life, and these antifouling compositions are necessary for vessels trading in waters where fouling is likely to occur. A hard glassy surface offers no resting place for the germs, and even after this smoothness has been partly eroded by the action of sea water, the poisonous constituents of the compositions reduce the marine growths.



The intercoastal liner California being painted with "Red Hand" bottom composition at Hunter's Point drydock, San Francisco

Northern Double Packed Valves

THE Northern Pump Company of Minneapolis, Minnesota, has recently taken over production of the patented "Double Packed" valve formerly manufactured by the Victor Manufacturing Company of Niles, California. These valves will now be known and marketed under the name of Northern Double Packed Valve.

This plug valve overcomes the inherent tendency of ordinary stop cock to either stick or leak. Northern Double Packed valves cannot keep leaking, because of the stuffing boxes located at top and bottom of the plug, the two points where leakage could occur.

Neither can these valves stay stuck. Slight tightening of the bottom packing gland usually will loosen a stuck plug; but if this should fail, a sharp blow on the bottom will certainly jar loose a plug which has become stuck tight.

Northern Double Packed valves are lubricated by a simple but positive method, insuring correct lubrication of valves used in air and gas lines which carry no liquid and are normally dry. Alemite fittings are installed on valves which require lubrication, at the request of the purchaser. Otherwise the openings will be closed by plugs, interchangeable with the Alemite fittings.

The ports in Northern valves are regularly rectangular in shape, of practically the same area as the corresponding pipe. These regular ports are called Smoothway. If the

valve is required for throttling service, Diamond ports may be had at the option of the purchaser.

Three-way and four-way Northern valves are available, in the Smoothway type, also a line of steam-jacketed valves. Both lines

are manufactured and stocked in all ordinary sizes and in either Victory bronze, cast steel, or semi-steel.

King-Knight Company, with offices in San Francisco, Seattle, and Los Angeles, are Pacific Coast distributors for Northern Pump Company products.

Trade Literature

Oxweld Acetylene Company, 30 East 42nd Street, New York, N.Y., has recently issued a booklet describing the uses of the Carbic portable generator for low pressure acetylene. This booklet will be sent free on request.

This company has recently printed also a booklet entitled **Oxweld**. This describes in detail products manufactured by this concern, including welding and cutting equipment of all sorts and generators for the production of acetylene. New items described in this edition are the new type C-14 cutting blowpipe, the Carbic portable low-pressure acetylene generators, and the Carbic floodlights. The booklet will be sent free on request.

Increasing Marine Profits is the title of a new 40-page bulletin just published by the Diamond Power Specialty Corporation.

The bulletin deals frankly with the fact that the shipping industry of the United States is to-day forced by competition to a higher plane of operating efficiency than was ever before believed possible. It

points out that dearly bought experience has taught that dividends are to-day very largely the result of specific economies effected in various phases of vessel operation. The necessity of economical power development, with special reference to boiler operation, is presented in detail with many charts and illustrations. The experiences of many ship owners in reducing their operating costs is told in their own words.

Finally, the bulletin describes Diamond soot blowers as applied with coal, pulverized fuel, and oil firing, to Scotch and water-tube boilers of all types, superheaters, air heaters, and economizers for both merchant marine and naval use.

Copies of this bulletin are available upon application to Marine Department, Diamond Power Specialty Corporation, 12 East 41st Street, New York.

General Electric Company has recently prepared two booklets on the subject of arc welding.

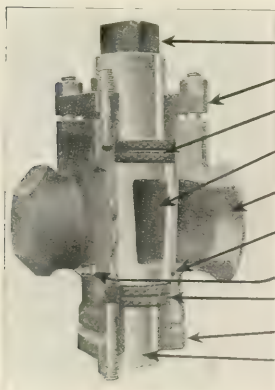
One is entitled **Arc Welding in Industry**. This is a bulletin which illustrates and describes the application of arc welding to groups of basic operations commonly found in industrial plants.

The other is entitled **Arc Welding in G-E Factories** and is printed in the hope "that this portrayal of General Electric's accomplishment will promote a further use of the welding art throughout industry."

Both booklets are for free distribution.

TRADE NOTE

The sale of Palmetto Packing is steadily increasing along the water front since the Hercules Equipment & Rubber Company have handled same. This Packing is nothing new to the Marine Trade. For a period of sixty years, the manufacturers of Palmetto Packing have endeavored to produce goods that have the long service-quality of true economy.



Top of plug—Grooved to indicate direction of port. Opens or closes by turning either way.

Top gland.

Packing in top stuffing box. (4 rings in most sizes.)

"Smoothway" port. Almost full pipe area.

Illustrated screwed valve. Flanged if wanted.

Lubricating groove—In body only—simple, positive.

Alemite (or Zerk) fitting.

Packing in bottom stuffing box.

Bottom gland.

Bottom of plug—Projects below.

Northern double packed plug valve.

Improving Condenser Performance

IN many marine condensers shortness of tube life is due to thinning of the tubes at the inflow end or the development of pinholes a short distance away from the inflow tube end. Experiments have quite definitely established that this deleterious action is due to the bombardment of air and water particles throughout such portion of the tube in which reduction of pressure results from the contraction of the inflow stream.

The old method of assembling condenser tubes, in which ferrules are employed at the inflow ends, leaves an obstruction or sharp orifice effect and it is well understood by hydraulic engineers that a reduction in pressure results where water starts to flow through a tube thus assembled. The contraction of the inflowing stream is termed "vena contracta."

Figure 1 illustrates the manner in which the inflowing stream contracts, due to the sharp edges presented by the ferrule, as well as the tube end, and it is within the area of stream contraction that the most rapid corrosion or tube thinning and pinholes develops. Many attempts have been made to round out the ferrule as illustrated in Figure 1, but even this does not promote a full stream line through the tube.

The Crane Packing Company has developed a method of condenser tube assembly which has proved far superior, it is claimed, to anything heretofore in use. This method is illustrated in Figure 2.

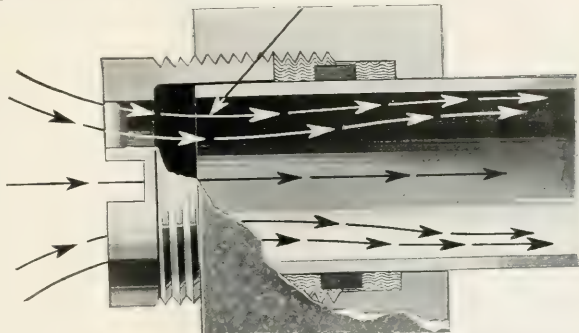


Figure 1. The diagonal arrow, upper center, indicates the formation of vacuum at the point of vena contracta.

It will be noted that on the inflow end a special metallic bonded fiber bushing is forced over the tube and into the space usually occupied by the packing. The tube end is then expanded into this "metallic bonding" fiber bushing, after which the tube end is belled or flared, thus affording free and easy access for the inflowing stream which then passes through in a straight, full, flow-line, which eliminates the deleterious action of the bombardment of air and water particles. Without this bombardment, these air particles pass straight through the tube without producing erosion of the tube's metal.

On the outflow tube end, the regular threaded portions of the tube sheet drillings are filled full

with John Crane metallic packing and, inasmuch as no brass ferrules are required with this process, greater packing depth is available. This feature insures greater condenser tightness.

During the past year many ship condensers have been equipped with this "new method" of packing and universal satisfaction has resulted from each and every installation. The work of installation is accomplished with greater ease and in less time than is usually required for corset lace packing. Through the elimination of the brass ferrules, commonly employed with corset lacing, condensers may now have the new method installed at approximately the same cost as packing with corset lacing and ferrules.

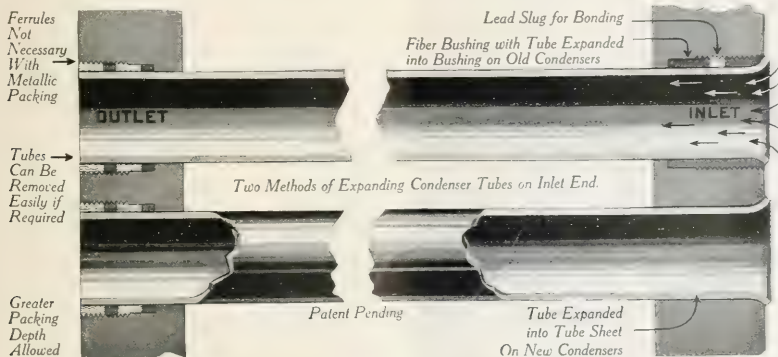


Figure 2. Illustrating the straight line flow with belled end condenser tubes installed by the new Crane method.

Miscellaneous Trade Notes

E. C. Myers, well known manufacturers' representative of San Francisco, has recently been appointed distributor in San Francisco for the products of the Terminal Engineering Company, Inc., of New York, manufacturers of the Tek line of trucks especially designed for handling materials in tight places.

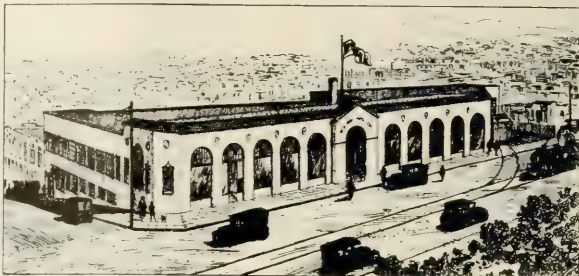
The Tek 4-wheel steer and 4-wheel drive will turn around a 24-inch column, touching it all the way round. These trucks are manufactured with a variety of accessories, including portable derricks, tiering machines, dump bodies, and a variety of industrial apparatus such as concrete mixers.

Consult Mr. Myers on your materials handling problems.

John Finn Metal Works of San Francisco and Seattle have recently issued Catalog No. 11 which describes and illustrates the various grades of bearing metals which this firm manufactures and has been supplying to industrial plants on the Pacific Coast for the past forty years.

The company manufactures all types of metals, solder, and plates, specializing in John Finn Babbitt metal. This little catalog is a very interesting history of the firm's accomplishments and standing and contains many testimonials and photographs of products made from John Finn Metals.

Profitable Application of Industrial Trucks and Tractors in Industry. Of likely interest to plant managers, department heads, efficiency experts, or any who have to do directly or indirectly with materials



Artist's sketch showing the new extension of the San Francisco plant of the W. S. Ray Manufacturing Co., made necessary by this firm's growing business in the Ray rotary fuel oil burner.

handling in and about warehouse and factory, is a brochure just off the press dealing with the efficiency and economy of the electric truck and tractor in industry.

The handbook, of 96 pages and some 136 illustrations, is published by The Society for Electrical Development in cooperation with 20 manufacturers of electrical industrial trucks and tractors.

Vehisote

For many of the better class construction jobs recently put out by American shipyards, the designing naval architects have found in Vehisote a very fine medium for expressing the elegant simplicity of colonial interior decoration which has become the dominant note for American merchant marine interiors. One good example of this will be found in the recently completed



Passageway in the first class quarters of the liner Waialeale, featuring the use of Vehisote for ceiling.

Inter-Island Steam Navigation Company's passenger liner Waialeale. In this vessel all ceilings in the passageways, staterooms, and public rooms of first class passenger accommodations were finished in Vehisote.

This material possesses inherent qualities which enable it to hold its form and surface practically unimpaired in the presence of salt moist air. In fact, in a number of instances where vessels finished in Vehisote have been sunk the Vehisote on salvage has been found to be intact. Its surface texture makes an excellent foundation for pigments and enables the interior decorator to produce pleasing effects in any shade or color.



C. J. Hendry Company has catered to ship needs in San Francisco for almost two generations. Above is shown their fine new store and warehouse building at the San Pedro branch.



Marine Insurance

Edited by JAMES A. QUINBY

Another West Aleta Decision

WE have with us a decision of the United States Circuit Court of Appeals for the Second Circuit, in which cargo owners are successful in recovering for certain goods lost when the now famous West Aleta stranded on the coast of Holland in February 1920. (See *Smith & Catz American Shipping Co. vs. United States Shipping Board Emergency Fleet Corporation*, 1928 A.M.C. 969.) The case adds insult to the injury recently sustained by the majority of cargo interests on the same voyage, when the Supreme Court (The West Aleta, 1928 A.M.C. 441) held that no recovery could be had because suit was not filed in time, the remedy under the Suits in Admiralty Act being exclusive.

In the present case, the court examines the evidence in much the same manner as it was examined in the lower courts on the original case, and decides that the vessel deviated with respect to Rotterdam cargo in passing by Rotterdam for Hamburg, intending to discharge the Rotterdam cargo on her return.

Deviation Principle Affirmed

The deviation clause in the West Aleta's bills of lading purported to give the vessel leave "to touch at any port or ports, in any rotation or order in, or out of, the customary route and to call at any port or ports more than once. . . ."

"It is clear from the authorities," says the court, "that clauses permitting deviation from the usual route of navigation have always been construed strictly and with reference to the particular voyage contracted for. See *Scrutton on Charter Parties* (12th ed.) 297; *I Arnold on Marine Insurance* (11th ed.), 575. The early case of *Gairdner vs. Senhouse*, 3 Taunt. 16, construed the clause 'to touch and stay at any ports and places whatsoever,' but this was confined to the voyage insured and was held not to justify a departure from the ordinary route. Later came *Leduc vs. Ward*, 20 Q.B.D. 475, involving 'the liberty to call at any ports in any order,' and this likewise was limited to ports substantially on the course of the voyage. *Glynn vs. Margetson* (1893), A.C. 351, applied the same canon of construction to 'any port or ports, in any rotation.' Such

Destiny

I spoke on a time with a slender young pine
All graceful to the breeze
"I am not," she said, with a toss of her head,
"Like the common run of trees.
When in time I am cut, I shall never stay put
No humdrum position for me
All that I ask is a job as a mast
On a sailing ship at sea."

In the fullness of time when she'd reached her prime,
The axeman cut her down.
With sharp-edged caresses they barbered her tresses
And shipped her in to town.
They sawed her and trimmed her, this wayward young
timber
And planed her down into squares
Now her shapely limbs are excellent legs
For a thousand kitchen chairs.

J. A. Q.

clauses relieve the ship of putting into ports along the customary route in their geographical order; but they do not permit a departure from that route. There are sound business reasons for limiting the general words of the liberty-to-call privilege to what is fairly applicable to the voyage agreed upon and those reasons are well stated by Lord Justice Bowen in the case last cited, reported in (1892), 1 Q.B. 337,342. The American cases are in accord with the British. *Ardan Steamship Co. vs. Theband*, 35 Fed. 620 (D.C.), *Wells City*, 61 Fed. 857, 858 (2 CCA);

Joyce on Insurance, 2nd ed., sec. 2396.

Finding that the 'rotation' clause has been thus limited, ship owners sought greater latitude by adding 'in or out of the customary route.' This of course accomplishes something, and in *Blandon* 1923 A.M.C. 242, 287 Fed. 722 (SDNY), was held to excuse a deviation to Philadelphia on a voyage from New York to Valencia. But this clause, like all the others, must, we think be read as ancillary to the purposes of the voyage contracted for. It allows a ship to depart to some extent from the customary route between the termini of the voyage; but to allow her to pass the very terminus ad quem and proceed to a port two hundred and fifty miles beyond would contradict the governing object of the contract, namely, the prosecution of the named voyage. Clearly, there must be some limit or the voyage has no meaning, and the risk becomes indefinite. Persons dealing with the bill of lading, or insuring the cargo, do not expect the vessel to pass beyond the port of destination, and the liberty of doing so should not be read into the contract unless granted in the clearest language. Where it has been expressly provided that the ship may go beyond, this has been allowed. *Emelia S. De Perez*, 1923 A.M.C. 42, 287 Fed. 361 (SDNY); affirmed, 288 Fed. 1019 (2 CCA). But no case, so far as we are informed, supports appellant's contention that the clause in question should be given an equally broad meaning."

A Minor Detail

It thus appears from the decisions of all courts involved in the various West Aleta cases, that the vessel unquestionably committed a deviation. The only dis-

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
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714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

tion between the present case and the former million dollar fiasco is that in the present case the suit was filed on time. It is cause for regret that an issue involving such a heavy loss to cargo interests should have been upset by a technicality, especially since the time provisions of the Suits in Admiralty Act had to be interpreted, eight years after the passage of the Act, before anyone anticipated the existence of the technicality. In spite of this justification, however, the parallel cases here discussed provide a valuable if costly lesson in the necessity of observing minor details, such as the time within which to sue.

We are reminded of an anecdote favored by an aviation instructor during the war, which recounted the sad tale of a student who had thoroughly learned all the various details preparatory to making a parachute jump from a balloon. Sand ballast must be attended to, the rip-cord of the bag pulled, the parachute draped and folded correctly over the side of the basket, and the parachute rope snapped into the shoulder-harness worn by the jumper.

On his first and last jump, the student in question remembered all the details with a single minor exception. He forgot to hook the parachute into the harness.

How to Learn Something About Marine Insurance

NOW that the vacation period is about over and the virile young business man is (or should be) full of vim and enthusiasm for his job, we meet again those earnest individuals who wander into our office and announce that they are traffic managers, or loss men, or whatnot, and want to learn more about the noble field of marine insurance.

To such as these (and there must be many of them among our readers, otherwise why would they read this column at all?) we can only discuss certain available educational facilities and approve a list of selected text-books. Other branches of insurance, due to their greater spread, have developed to the point of providing institutes in most of our larger cities, where the student may find evening courses suited to his needs. With the exception of London and New York, no maritime centers have yet offered complete courses in marine insurance.

What a Young Man Should Read

For those who wish to read up on the subject, we offer a list of the better-known texts, with comments as to their nature.

Arnould on Marine Insurance. Eleventh Edition, 1924, two volumes. The most thorough work on the subject, and the only one which has attained the status of an authority. The effort of an English author, brought up to date by competent editors. Best used as a book of reference, as its scope makes it difficult to assimilate as a whole.

Gow on Marine Insurance. First edition 1895. Fourth Edition 1917. A shorter English work, excellent as to basic theory.

Gow on Sea Insurance (1914). Based entirely on the British Marine Insurance Act of 1906. Not recommended as a general text.

Lowndes on Marine Insurance (1885). A rather heavy English text, somewhat out of date, but thorough as to reasoning.

Lowndes on General Average. Sixth Edition, 1922. Excellent as to the English theory of general average, but not as well arranged nor as compact as Congdon.

Congdon on General Average. Second Edition, 1922. The only American text on general average.

Winter on Marine Insurance (1919). A compact, elementary work by an American author.

Templeman on Marine Insurance. Another fairly good short text.

Huebner on Marine Insurance. An easily read, elementary work by Professor Huebner of the University of Pennsylvania. Has lots of background, but is not particularly practical.

Out of the above list, the student would do well to read thoroughly one of the shorter texts—preferably Winter—and refer specific problems to Arnould. The use of text books, especially for the purpose of gaining an elementary knowledge of the subject, is rendered necessary by the lack of a thorough course in marine insurance on the Pacific Coast.

A course of lectures is sponsored by the Association of Marine Underwriters of San Francisco during the winter months of the year, but these lectures are in no sense a scientific study of the subject. They are rather a clearing house for ideas, addressed by navigators, surveyors and other experts in various lines immediately or incidentally touching upon marine insurance. The service is free to those who attend, the incidental expense of the course being borne by the Association. The class meets fortnightly from October until May, the present winter marking the Eighth Term. Those interested may obtain further information by addressing the editor of this department.

INSURANCE COMPANY

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LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

09 COLMAN BUILDING, SEATTLE, WASHINGTON

Mixed Cargo

In the case of *Pendle and Rivet v. Ellerman Lines*, XXXIII Com. Cas. 70, an English court held an ocean carrier liable for the unexplained pilferage of the contents of a case of wool and silk goods.

The case was delivered empty, according to an affidavit made at destination. "It was opened in my presence," runs the noble affidavit, "and found to be empty of goods; it only contained ten copies of the French periodical *Illustration*, edition of September 4, 1926."

The dirty bums might at least have used copies of *La Vie Parisienne*.

All of which reminds us of the case of a well-known glove merchant who was importing goods from Germany a few years ago—just at the height of the pilferage epidemic.

The gloves were manufactured inland and insured only from the seaport to destination. A majority of the cases in a given shipment would inevitably arrive with coal substituted for gloves.

The insurers had the coal analysed, and it proved to be a variety mined and used exclusively in the interior of Germany. This convinced the insurer (if not the merchant) that the loss occurred before the ocean transit began.

And while we're on the subject of peculiar cases, there's one put up in book form by the West Publishing Company, called "Human Jettison." It contains the documentary record of a shipwreck in 1840, which left forty-odd survivors in an open boat which could safely carry only eighteen. The superfluous passengers were accordingly shoved overboard by the crew.

There is another case in the books—an English decision this time—having to do with certain survivors on a raft who ate the cabin-boy, and thus kept alive until rescued.

We'll have to speak to A. Middleton Beckett, or Pete Prentiss, and find out how much of an allowance an adjuster would grant for a cabin boy sacrificed for the common benefit.

You never can tell by appearances. Take our good friend Jim Resleure, for example, who helps peddle admiralty law along California Street. Jim has only half as many legs as the rest of us, and yet he shows his heel to the majority of two-legged swimmers who frequent the Olympic Club pool.

And versatile, too. He now announces himself the father of a baby girl, born July 25.

When Is a Gangplank?

The Supreme Court of Washington in a recent case (*The Bainbridge*, 1928, A.M.C. 1230) has recently held that a carrier is liable for personal injuries received by a passenger who falls from an open gangplank, even though the plank developed no unexpected defect. An extract from the opinion is as follows:

"The appellant corporation is engaged in the steamboat business on Puget Sound carrying passengers and freight between Eagle Harbor and Seattle. On December 5, 1926, the respondent, as a passenger for hire, started to board the appellant's steamer, the *Bainbridge*, at a landing known as Creosote Dock. The gangway placed for passengers to use in boarding the steamer was composed of two planks ten feet long and about nineteen inches wide, fastened together by cleats upon the top at intervals of thirteen inches. The gangplank had no guard of any kind along its sides to assist or protect passengers while using it to board the steamer. On the day in question the tide was at such a level that the gangplank was inclined from the dock to the lower deck of the steamer at an angle of approximately thirty degrees. As passengers proceeded down the gangplank to board the steamer the passageway to the boat was not high enough for them to enter in an erect position, so employees stood near by and instructed the passengers to "duck your heads." Several passengers proceeded respondent with safety, but as she reached the point where she was required to adopt a stooping position she lost her balance and was precipitated to the deck of the boat with severe resultant injuries. Upon appeal it is urged by appellant that the complaint presented no cause of action, and that the case should not have been submitted to the jury. The point specially urged seems to be that there was no negligence in using a gangplank with neither guards or rail to assist or protect the passengers. With this contention we can hardly agree. The use of a gangplank constructed as this was can hardly be said to be the exercise of that high degree of care to provide a reasonably safe means of ingress and egress which a public carrier owes to its passengers for hire. It surely requires no argument to establish the fact that an unguarded plank set at an angle of thirty degrees, one end resting on the dock and the other on the ship, and the use of which requires a passenger to walk down the incline and assume a stooping position to get upon the boat, is decidedly an unsafe method to present to the public for its use."

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A New and Greatly Improved Lifeboat

Designed in Italy, Offered Free to the American Government

WORLD interest attaches to a new type of life-boat recently designed by David S. Neill, of Genoa, one of the leading maritime lawyers of Europe, an English attorney who for twenty-five years has practised law in Italy.

As attorney for the British insurance companies in the loss of the Italian steamer, the *Principessa Mafalda* last year, which resulted in the drowning of 296 persons, Mr. Neill made a study of the part played in this loss by the type of life boats used and a study of life-saving equipment generally, and reached the conclusion that the lives of most of those drowned in the accident could have been saved with an improved life boat. Mr. Neill became greatly interested, continued his studies, and as a result he has designed this new life boat, and has at his own expense had a model built and tested.

Mr. Neill has no desire to profit commercially through this beneficent invention but is actuated solely by humanitarian motives. He is offering his invention free to the United States Government for use in the American Navy and merchant marine, together with all of his rights which he has in patents

pending in the United States Patent Office. Mr. Neill has similarly offered the British rights free to the British government for use in the British Navy and merchant marine; and likewise the Italian rights to the Italian government; he has patents pending in both those countries.

The British government on receipt of this offer from Mr. Neill immediately sent one of the leading commanders in the British Navy to Genoa to inspect and test this boat. And the British Board of Trade is favorably considering the adoption of this boat on merchant vessels. The British Admiralty likewise. The Department of Commerce of the United States has expressed great interest in this new type of boat.

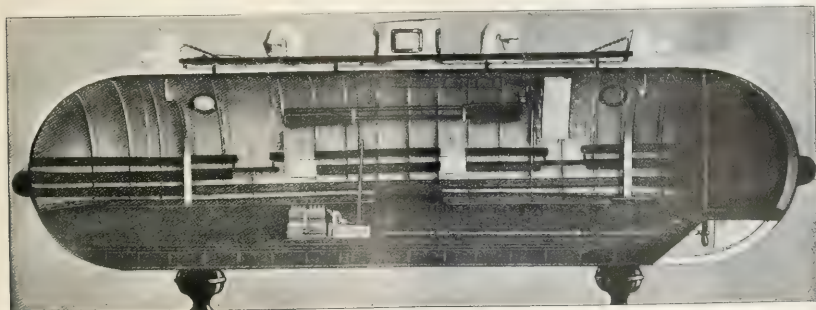
The public that travels on ships, the marine insurance companies, the navies and the merchant marines of the world, and the companies operating our luxurious ocean liners will be very much interested in seeing this new and apparently safer type of boat tried out.

With this boat the danger of the occupants being thrown overboard if the boat should be lowered unevenly is eliminated; overcrowding will not impair the buoyancy

of the boat nor cause it to swamp in a rough sea; and the occupants will be protected from exposure. Since the number of experienced seamen on a steamer is limited, it is very important that in case of emergency, it be possible to have the life boats manned by the fewest possible number of able seamen.

Mr. Neill's boat is constructed of light, high-resistance metal, and is mechanically propelled, with oars as an auxiliary means of propulsion. Entrance is through lateral, sliding doors, so arranged as to be easily and hermetically sealed. A thirty-foot boat has a capacity of 80 to 100 persons. Attached to the boat are fender rollers, permitting the boat to roll smoothly down the side of a sinking ship, if she has a list. A conning tower placed amidships with water-tight lid may serve as exit and entrance supplementing the side doors. Ventilating water-tight cowl is situated on the top part of the hull, and a mechanical hand-pump is provided. Fresh water and fuel are carried in the double bottom; the boat also has a small store room and lavatory. This boat will withstand in full safety the strongest gale imaginable, being virtually a buoy, and will afford protection to its occupants against exposure for any length of time.

It is to be hoped that the United States government will accept Mr. Neill's generous offer to give his rights in this boat free to the people of the United States for the use of the American navy and merchant marine. Mr. Neill is well-known to the American admiralty lawyers. Last year he was selected by the American Ambassador in Rome, Hon. Henry P. Fletcher, to represent American interests in important litigation in Italy in which Americans were interested.



Model of an improved lifeboat designed and patented by David S. Neill, admiralty lawyer of Genoa.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

SHIPBUILDING WORK IN PROSPECT

Tacoma Fireboat Bids

The original specifications for a fireboat have been changed and new bids have been called by Dyer Dymont of the Commissioners of Public Safety of Tacoma, Washington. Under the new specifications, the guarantee bond has been reduced from five years to one year, the required speed from 18 to 16 knots, and gas-electric power installation is permitted.

Dollar Plans Turbo-Electric Liners

We are informed that, as plans of the Dollar Steamship Company, San Francisco, for the program of new liner construction under the Merchant Marine Act materialize, it has been practically decided to construct six combination passenger and freight liners with turbo-electric propulsion power.

Export Steamship Corporation

Issues Plans for Vessels

Following award of contract for special mail subvention under the Merchant Marine Act, 1928, the Export Steamship Corporation, 25 Broadway, New York, has announced through H. E. Frick, vice-president, that plans will be ready this month and bids will be asked from shipyards for the construction of four combination passenger and freight steamers for the New York-Mediterranean service. The vessels are being designed by George G. Sharp, 30 Church Street, New York. They will be 450 ft. long, 59 ft. molded beam, 46 ft. 6 in. molded depth; 9500 tons deadweight; capacity for 4500 tons of general cargo, 500 tons of refrigerated cargo, and 100 passengers. Power will be supplied by steam turbines connected through single reduction gearing to a single propeller.

Matson Plans Two Large Vessels

Instead of constructing three vessels for the San Francisco-Australia service of the Matson-Oceanic Line, the Matson Navigation

Company is considering plans for two speedy vessels to be built under the Merchant Marine Act, 1928.

Freight Vessels for East Coast

The Di Giorgio Fruit Company, 25 Broadway, New York, is reported to have issued specifications to shipyards and called for bids on construction of one and two freighters for its West Indies trade.

Union Oil Company Plans Tankers

Orders for two vessels for the Union Oil Company of California, with headquarters in Los Angeles, are still in abeyance. The plans of the company call for one large seagoing tanker and one self-propelled tank barge for British Columbia coastwise service.

Grace Line Plans Tonnage

To meet the requirements of the recently awarded contract for the carriage of mails to the West Coast of South America, W. R. Grace & Co. of New York, must place an order for the construction of a 16-knot vessel for completion within a year, and an additional vessel must be completed within three years. Reports from the East Coast say that the company is considering diesel-electric propulsion for these two vessels, which will be similar to the Santa Maria, put into service recently.

New Ferryboat for San Diego

We are reliably informed that the San Diego & Coronado Ferry Company, San Diego, plans the construction of a modern ferryboat for operation between San Diego and Coronado. Atlas-Imperial diesel engines and Westinghouse electric equipment are specified. Bids for construction have been asked from shipyards. S. E. Mason of the San Diego Electric Car Lines is in charge of plans.

The Board of Harbor Commissioners of Los Angeles Harbor is

in the market for a pilot boat of 16 knots speed.

Canadian Construction in Prospect

The Dominion Parliament recently authorized \$1,000,000 for a car ferry steamship to be built by the Canadian Government Railways for operation between New Brunswick and Prince Edward Island.

The Dominion Parliament recently authorized the construction of two ice-breaking steamships. One for Hudson Strait to cost \$1,000,000 and one for St. Lawrence River to cost \$600,000. Plans will be drawn up immediately by the Minister of Marine.

Bids Called For Reconditioning of Mount Vernon and Monticello

Bids will be opened October 2 in the office of Captain R. D. Gatewood, manager of the Department of Maintenance and Repair, Merchant Fleet Corporation, 45 Broadway, New York, for the reconditioning of the Shipping Board liners Mount Vernon and Monticello, former German vessels, which have been laid up since 1921.

Plans and specifications prepared by Gibbs Brothers of New York and by the Newport News Shipbuilding & Drydock Company have been issued to shipyards, and several alternatives are permitted for the rebuilding of passenger quarters and changing or replacing the propulsion machinery.

The proposals all cover the conversion of the vessels to cabin class liners, carrying between 600 and 700 first class passengers and around 400 tourist class passengers with the necessary complement of crew. Accommodations are to be of the most modern type with ample public rooms and promenade decks. The vessels are also to be equipped to carry dry cargo, refrigerated cargo, and mail, in addition to passengers, baggage and ship stores.

Gibbs Brothers' plan calls for the installation of geared turbine pro-

pulsion power, operating twin propellers. This requires two sets of propelling machinery of four turbines each and two sets of gears in full operation, with two turbines and gears for cruising at reduced speed. Each set of turbines and gears is to drive one propeller through an independent line of shafting and to deliver 14,000 shaft horsepower, giving the vessel a total shaft horsepower of 2800 at 125 revolutions per minute and a normal sea speed of 20 to 21 knots. Twelve oil-burning water-tube boilers with a total heating surface of 54,500 square feet and a superheating surface of 11,200 square feet, will provide steam to the turbines.

Several alternatives in the propelling plant permit installation of different combinations of geared turbines, also turbo-electric drive and direct diesel drive.

Bids Called by Shipping Board for Conversions

Bids were requested from shipyards of the East Coast by the Dept. of Maintenance and Repair, U. S. Shipping Board, 42 Broadway, New York, for the cost of installing diesel machinery in eight Shipping Board vessels and for reconditioning these vessels for the carriage of a limited number of passengers, the maximum being fourteen.

The vessels are now laid up in the James River and are the Galveston, Oldham, City of Elwood, Ward, New Orleans, Wichita, Jeff Davis and Porter. The engines are now nearing completion and two each are being supplied by McIntosh & Seymour Corporation, Busch-Sulzer Bros.-Diesel Engine Co.; Hooven-Owens-Rentchler Co.; and Worthington Company.

Work to be done by the shipyards will consist of removal of the present propulsion machinery and steam auxiliaries, installation of diesel engines and electric auxiliaries, and the fitting of the forward house for accommodation of passengers.

New York Department to Build Ferryboats

The Department of Mental Hygiene of New York State, Lewis M. Farrington, secretary, Albany, has called for bids for the construction of two 115-foot diesel-electric ferryboats. Separate bids are to be taken on hull and machinery. Eads Johnson, 115 Broadway, New York, is the designer.

Bids Opened for Navy Dirigible

The American Brown Boveri Electric Corp. was one of the bidders for the design and construction of the two rigid airships for the Navy Department, bids for which were opened at Washington August 10.

Bids for the design were submitted by a number of American and German engineers. One other bid for design and construction was submitted—that by the Goodyear Zeppelin Co., Akron, Ohio. Intention to submit bid on design and construction was filed by Robert T. Pollock, 20 East 76th Street, New York.

Lawrence T. Wilder, head of the shipbuilding department of the American Brown Boveri Electric Corp., in requesting permission to bid on the construction of the airships, stated that his organization was prepared to build one of the dirigibles at the flat rate of \$4,000,000 approved by Congress. Only \$2,000,000 has been appropriated

toward the start of this work—which calls for a total cost of \$8,000,000 for the two ships.

Todd Low On Ferryboat Bid

Todd Shipyards Corporation, New York, submitted low bid for the construction of a double-end steel steam ferryboat for the City of New York Department of Plant and Structures. The ferryboat is to be 151 feet long, 53 feet over guards; 37 feet 6 inches depth to top of beams; draft 8 feet 3 inches. Two vertical direct-acting fore and aft compound engines, coupled together, will be connected to the propeller at each end. Two oil-burning water-tube boilers will supply steam at 225 pounds pressure.

The Todd Shipyards Corporation bid \$353,241 for the construction of this boat; but since only \$260,000 has been appropriated, an additional allotment will be necessary in order to complete contract.

Recent Shipbuilding Orders

Fellows and Stewart, Wilmington, California, have an order from Allan Stearns of Los Angeles for a 65-foot schooner yacht to carry 2000 square feet of canvas spread and have an auxiliary motor of 50 horsepower.

Spears Engineers, Inc., Portsmouth, Va., have received contract from the U. S. Coast and Geodetic Survey for a single-screw, diesel-electric survey vessel, 167 feet long, 31 feet beam, 11 feet draft. Engines will be ordered separately; Winton Engine Co. will supply pumps and American Engineering Co. will supply winches and windlasses.

Nashville Bridge Company, Nashville, Tenn., has an order from Da-

vidson County, Tenn. for a 60-foot ferryboat.

Ballard Marine Railway Co., Seattle, has an order from Young Brothers, Ltd., Honolulu, for a tugboat; 125 x 28 x 14 ft.; two 520-H.P. Fairbanks-Morse diesel engs.; Allan Cunningham deck auxiliaries.

Prince Rupert Drydock & Shipyard, Prince Rupert, B.C., has just received an order from the Canadian National Railways for a car barge 270 ft. long, 42 ft. beam, 12 ft. depth.

Consolidated Shipbuilding Corp., Morris Heights, N.Y., has an order for a 66-foot cruiser for J. McMillan of Detroit to be powered with two 170-horsepower Speedway engines; delivery May 1929.



Above is a photograph of a new stern frame for the steamer *Manhattan Island*, forged, machined, and assembled at the San Francisco plant of Bethlehem Shipbuilding Corp., and shipped to the San Pedro Works for installation.

The upper section is cast steel and weighs 10,000 pounds; the lower section is forged and weighs 14,600 pounds.

Dravo Contracting Co., Pittsburgh, Pa., has an order from the Atlantic Gulf & Pacific Co., New York, for two 80-ft. steel derrick barges.

Spedden Shipbuilding Co., Baltimore, Md., has an order from the Commissioners of Washington, D.C., for a patrol boat, 52 ft. 9 in. length, powered with 100-horsepower Standard diesel engine.

Howard Shipyards & Dock Co., Jeffersonville, Ind., has an order for 9 steel needle flats, for the U.S. Engineers' Office, Louisville; also 2 120-ft. barges for the Mississippi River Commission, New Orleans.

Moore Dry Dock Company, Oakland, Calif., has an order from the Board of State Harbor Commissioners, San Francisco, for a steel clam shell dredger, 90 x 41 x 12 ft. 9 in.

Bath Iron Works, Bath, Maine, has recently received from Henry J. Gielow, Inc., New York, an order for a twin screw steel diesel-powered yacht to be 260 ft. long, 35 ft. beam, 22 ft. depth; 14 ft. 6 in. draft; powered by two 1200 B.H.P. Bessemer diesel engines.

Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass., has received a contract from the Berwind-White Coal Mine Company, 1 Broadway, New York, for two single-screw colliers to burn pulverized coal; 366 ft. 6 in. L.O.A.; 50 ft. beam; 23 ft. 6 in. draft; 10,020 tons displacement; 10½ knots speed. One will be equipped with Scotch boilers, Hooven, Owens, Rentschler reciprocating engines; developing 2200 shaft horsepower; the other will be equipped with two watertube boilers and Bethlehem-Curtis turbines developing 1700 shaft horsepower. Each will have cargo capacity for 7000 tons of coal. Theodore E. Ferris, 30 Church Street, New York, is architect and supervisor of construction.

NEWS FROM THE SHIPYARDS

General Engineering Company Buys Shipyard

As we go to press it is announced that the General Engineering & Drydock Company of San Francisco, with plant in San Francisco and marine ways at Alameda, has purchased the business and properties of the Hanlon Drydock & Shipbuilding Company of Oakland.

The increase in facilities for drydocking and repairs which the General Engineering & Drydock Company obtains through this purchase gives the company a very strong position to obtain additional voyage and repair work on ships using the port of Oakland. The shipbuilding plant of the Hanlon plant will also give the General Engineering Company facilities for bidding on a wider range of ship construction.

George Armes is president and general manager of the General Engineering & Drydock Company.

Liner Virginia Launched by Newport News

The new Panama Pacific turbo-electric liner, Virginia, sister ship of the California, largest steamship ever built in America, was launched by Newport News Shipbuilding & Drydock Company August 18 and on December 8 will make her maiden voyage in the service of the Panama Pacific Line, operating between New York, Havana, Los Angeles, and San Francisco, via the Panama Canal.

The new ship is 613 feet long, has a beam of 80 feet, displacement 34,000 tons, depth of hull 52 feet, and a total depth of 100 feet from upper deck to keel. She is designed to carry over 800 passengers, 400 in first class and 400 in tourist cabin, and has a capacity for 8500 tons of perishable and semi-perishable

freight. Her speed will be 21¾ statute miles an hour, which will enable her to make the run of 5600 miles between New York and California in 14 days.

A contract for the construction of a third vessel already has been placed

Electrical Equipment of New Coast and Geodetic Survey Vessel

THE complete electrical equipment of the diesel-electric propelling machinery of the new Coast and Geodetic Survey vessel Hydrographer, now under construction at the plant of the Spear Engineers, Inc., Norfolk, Virginia, will be supplied by Westinghouse Electric & Mfg. Co.

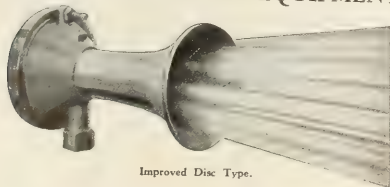
This vessel will be single screw and will have a length over-all of 167 ft. 5 in., a molded beam of 31 ft. 6 in., and will draw 9 ft. 6 in. forward and 11 ft. 6 in. aft. Her designed full speed will be 12½ knots.

Power for propulsion is supplied by two engine generator units, each comprising a single-acting, 4-cycle Winton diesel engine which develops 450 horsepower at 250 revolutions per minute and is directly connected to a main generator and a generator exciter. The main generators are shunt wound, separately excited, 250 volt machines of 270 kilowatts each. The generator exciters are compound wound, self-excited, 125 volt machines of 25 kilowatt each. The exciters furnish excitation to the main generators and power for the auxiliary machinery at sea. In port electric auxiliary power is supplied by separate diesel generator sets.

For the propulsion equipment the Westinghouse variable voltage system of control will be installed. Ar-

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rangements will be made for both bridge and engine room control.

The propulsion motor, which will develop 650 horsepower at 125 revolutions per minute, will be of the double armature type, with 250 volts on each armature. It is a shunt wound machine.

Most of the deck and under deck auxiliaries are electrified. These include engine room pumps and compressors, the anchor windlass, capstan, boat hoist, and steering gear.

RECENT REPAIR AWARDS

The Moore Dry Dock Company, Oakland, Calif., was recently awarded contract for damage repairs to the Hamburg-American Line's new motorship Seattle on a low bid of \$14,762. The vessel was damaged when she collided with the motorship Silverspruce just off the Golden Gate.

Hanon Drydock & Shipyard, Oakland, received contract for damage repairs to the Silverspruce on a low bid of \$12,480.

Burrard Drydock Company, North Vancouver, B.C., has the schooner

Oaxaca belonging to Captain G. Allan Hancock, which went ashore in Wrangel Narrows, damaging the bottom and flooding the engine room. The estimated damage is around \$60,000.

Todd Dry Docks, Inc., Seattle, has order for temporary repairs to the Norwegian motorship Grosholm on a bid of \$20,000 for overhauling machinery, repairing propeller and damaged bottom plates.

United Engineering Company, Oakland, will renew main engine crank shaft of the Oceanic Line freighter West Cajoot, on a bid of \$7888.

Bethlehem Shipbuilding Corp., San Francisco, on a bid of \$9565, received contract for repairs to the U. S. Army transport Kenowis.

Robert McIntosh Engine and Machine Works, Portland, Ore., received contract recently from the Shipping Board for a new stern frame for the steamer Wisconsin ex-Wawalon, on a low bid of \$12,700. The West Cadron, also to be transferred to the States Line, will be repaired by the Shipping Board. She has a broken stern frame.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of August 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS

Portland, Oregon.

Purchasing Agent: J. W. West.
Hull No. 100, diesel-electric lightship for U. S. Dept. of Commerce; 133'3" length over-all; 30' beam; Winton diesel engs.; General Electric motors; keel Sept. 1/28 est.
Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.
Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.,

UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.
Three steel dredge hulls for U. S. Smelting, Refinery & Mining Co., Oakland, Calif., 100'x50'x11'4"; 6 cu. ft. buckets.

GENERAL ENGINEERING & DRY DOCK CO.

Alameda, Calif.

Purchasing Agent: Geo. Armes.
Not named, hull 16, fishing boat for A. Paladini, Inc., San Francisco; 78' x 18'6" x 6'6"; 10 loaded speed; 200 H.P. Atlas-Imperial diesel eng.; launch July 7/28 est.; delivery July 20/28 est.
Hulls 17 and 18, mud scows for Board of State Harbor Comm.; 102 x 29 x 9'3"; delivery July 20/28 est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wash.

Reed No. 7, hull 152, scow for Reed Mill Co., Shelton, Wash.; 110'x36'x9'11"; keel May 29/28; launched and delivered June 22/28.

Reed No. 8, hull 153, sister to above; keel May 29/28; launched and delivered

June 28 and 29/28.

Scow for stock, 100'x36'x9'6".

Scow, same as above.

THE MOORE DRY DOCK CO.

Oakland, California.

Purchasing Agent: N. Levy.
Two flat wood barges for Raymond Concrete Pipe Co., San Francisco; 110'x34'x9'; launched May 29/28; delivered June 8/28.
Two caissons for Foundation Co., San Francisco; 64' long, 39'6" breadth; 26 high; No. 1 delivered July 2/28.
One steel carfloat for Western Pacific Railroad, San Francisco; 258' L.O.A.; 38' beam over-all; 12'6" molded depth; 7'9" loaded draft; capacity 14 80-ton cars; launch Sept. 28/28 est.; delivery Oct. 10/28 est.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est.; delivery Nov. 10/28 est.
One steel clam-shell dredger for Board of State Harbor Commissioners, San Francisco; 90 x 41 x 12'9"; launch Oct. 10/28 est.; delivery Nov. 30/28 est.

PRINCE RUPERT DRYDOCK & SHIPYARD

Prince Rupert, B.C.

One car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; delivery Jan. 10/29 est.

U. S. NAVY YARD,

Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; delivery Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.
One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7'.
Six barges for Union Barge Line; 132 x 35 x 10 ft.; 3 delivered.
Ten covered barges for Carnegie Steel Co.; 175'x26'x11 ft.
Forty-one barges for Mississippi River Commission; 120'x30'x7 ft.; 15 delivered.
Five sand and gravel barges for Mississippi River Comm., Memphis; 120'x30'x7'; 5 delivered.

AMERICAN BROWN-BOVERI ELECTRIC CORP.

Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; delivery July 9/29 est.

Chester, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; delivery June 13/30 est.

Hulls 376-377, two carfloats, Reading Company; 250'9" x 34'7" x 9' mld.; keels May 2/28; delivered June 25/28 and July 10/28.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 28 est.; delivery Dec. 28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel Sept. 28 est.; delivery Oct. 28 est.

Hull 381, carfloat for Pennsylvania Railroad Co.; keel June 12/28; launch and delivery Aug. 28 est.

Hull 382, same as above; keel June 12/28; launch and delivery Aug. 28 est.

Hull 383, same as above; keel June 26/28; launch and delivery Aug. 28 est.

Hull 384, same as above; keel July 19/28.

Hull 385, same as above.

Hull 386, same as above.

THE AMERICAN SHIP BUILDING COMPANY,

Cleveland, Ohio.

Purchasing Agent: C. H. Hirschberg.
Martha E. Allen, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 ft. beam, 18 loaded draft; 11 1/2 mi. loaded speed; 3700 D.W.T.; 2000 I.H.P. Werkspoor diesel engs.; aux. Scotch boiler; keel Dec. 12/27; launched June 9/28; delivery Aug. 1/28 est.

BATH IRON WORKS

Bath, Maine

Vanda, hull 117, twin screw steel diesel yacht; 240'x36'x22"; two 1500-B.H.P. Bessemer diesel engs.; keel Feb. 3/28.

Don Jorge, hull 118, single screw steel diesel towboat; 43'x10'; 50-B.H.P. Cummins diesel eng.; launched July 16/28; delivered July 17/28.

Boston College, hull 119, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x23'x14'; 400 B.H.P. Fairbanks-Morse diesel engine. Bath Iron Works design. Keel June 14/28; launch Oct. 1/28 est.; delivery Oct. 15/28 est.

Holy Cross, hull 120, trawler, same as above; keel June 14/28; launch Nov. 1/28 est.; delivery Nov. 5/28 est.

Georgetown, hull 121, trawler, same as above; keel June 14/28; launch Nov. 26/28 est.; delivery Dec. 1/28 est.

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. O. L. Swasey designer. Keel Oct. 15/28 est.; launch Apr. 10/29 est.; delivery May 1/29 est.

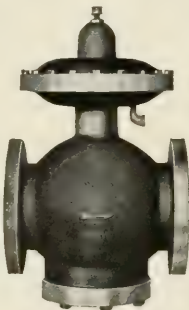
Not named, hull 123, twin screw steel diesel yacht, Henry J. Glowack, Inc., New York, designer; 260'x35'x22'; depth, 14'6"; draft, two 1200 B.H.P. Bessemer diesel engs.

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BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Chelan diesel-electric cutter for U. S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse for Detroit & Windsor Ferry Co.; 156 house turbines and motors; 3000 S.H.P.; launched May 19/28; deliver Aug. 7/28 est. Tahoe No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, hull 1418, steel passenger and freight steamship for the Pennsylvania Railroad Co., West Philadelphia; 300 ft. length, TE engs.

Not named, hull 1419, single-screw coal carrier for Berwind-White Coal Mine Co., 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10½ knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1420, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 WT boilers.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Hull 82, hopper barge for Dept of Railways and Canals of Canada; 180 L.B.P. 32 beam; 13 loaded draft; 8 mi. loaded speed; 800 D.W.T.; 700 H.P. TE engs.; 2 Scotch boilers, 12'6" diam; keel Mar. 21/28; delivered July 27/28.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2905, commuter boat for Harrison Williams; 56 ft. length; 2-650 H.P. Wright Typhoon engs.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May/29 est.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W. E. Whitehouse.

Memory III, hull 126, steel yacht for A. E. Fitkin, New York; 141'8" L.B.P.; 23'2" beam; 8' draft; 15 mi. speed; 350 D.W.T.; 900 I.H.P. diesel engs.; keel Nov. 15/27; launched June 5/28; delivered July 20/28.

Sea Sails III, hull 127, wood yacht for Murray W. Sales, Detroit; 89 L.B.P.; 16'9" beam; 5' loaded draft; 13 mi. speed; 75 D.W.T.; 160 I.H.P. diesel eng.; keel Jan. 12/28; launched June 17/28; delivered July 25/28.

Elto, hull 128, wood yacht for T. A. Yawkey New York; 56'x11'x3'; 26 mi. speed; 35 D.W.T.; 400 I.H.P. gas engs.; keel May 1/28; launch Aug. 20/28 est.; deliver Sept. 15/28 est.

Not named, hull 130, wood yacht for C. A. Caryell, Bay City; 90 L.B.P.; 17 beam; 4 loaded draft; 12 mi. loaded speed; 75 D.W.T.; 200 I.H.P. diesel eng.; keel June 20/28; launch August 15/28 est.; deliver Nov. 1/28 est.

Not named, hull 131, steel yacht; owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mi. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28 est.; launch Nov. 1/28 est.; deliver June 1/29 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engine towboat for stock; 125'6" x 26'6" x 5' 6".

Hulls 628 and 629, two steel barges for Hainesport Mining and Transp. Co.; 130'x 34'x10'.

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270'x38'x10'5"; 850 gons. ea.

Hull 705, mixer boat for Contract Dept.; 91'x40'x6'3"; 150 gons. ea.

Hulls Nos. 715-717 inc., 3 steel sand and gravel barges for Keystone Sand & Supply Co.; 135'x27'x8".

Hulls 718-723, 6 standard steel barges for stock; 130'x30'x7'6"; 250 g. tons ea.

Hulls 724-733, ten standard steel barges for stock; 100'x26'x6'6"; 135 g. tons ea.

Hull 734, steel hull derrick barge for Merritt, Chapman & Scott, Corp.; 116 x 43 x 12 ft.

Hull 735-38 inc., four steel barges for Keystone Sand and Supply Co., 135 x 27 x 8 ft.

Hulls 739-740, two steel snag barges for U. S. Engineers, Memphis; 84 x 24 x 3'6".

Hull 741, oil barge for Atlantic, Gulf & Pacific Co.; 80 x 30 x 8 ft.

Hulls 742-3, two steel derrick barges for Atlantic, Gulf & Pacific Co.; 60'x30'x6 ft.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 103, barge for Oil Transfer Corp., New York; 146'x35'x10'; keel June 4/28; launched July 11/28; delivered July 19/28.

HOWARD SHIPYARDS & DOCK COMPANY,

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hull 1641, towboat hull for Island Creek Coal Co., Cincinnati; 135'6"x26'6"x5'; keel Feb. 28/28; launched May 24/28; delivered June 15/28.

Hulls 1644-5 inc., two barges for U. S. Engineers, Huntington, West Va.; 80'x26'x5 ft.

Hull 1646, barge for U. S. Engineers, Huntington, West Va.; 80'x18'x4'6".

Hulls 1647-1655 inc., nine steel needle flats for U. S. Engineers, Louisville, Ky.; 40'x14'x3'6".

Hulls 1656-7, two barges for Mississippi River Comm., New Orleans, 120'x30'x7'6".

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 241, diesel tug for Great Lakes Dredge & Dock Co.; 114'6" L.B.P.; 27' beam; keel Feb. 16/28; launched Apr. 26/28; delivered Aug. 7/28.

MARIETTA MANUFACTURING COMPANY

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Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Twenty steel hopped cargo barges for Magdalena River, Colombia; 125x26x6 ft.; 15 delivered.

Stern wheel towboat for South America; 170x42x5'; launched.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tandem comp eng 14'x28'x84'; keel July 18/28.

Hull 235, sister to above; keel Aug. 1/28.

MIDLAND BARGE COMPANY**Midland, Pa.**

C. C. Slider, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x5'6"; steam tandem comp eng. 14'x28'x7'0" stroke; keel March 1/28; launched June 23/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6'6"; keels laid.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6"; keel laid.

One steel barge for P. M. Adema, Pointe à la Hache, La.; 120 x 36 x 6 ft.

Four dump scows for Div. of Canals and Waterways, State of New York; 100'x28'x7'6"; keels laid.

Six deck scows for Div. of Canals and Waterways, State of New York; 75'x25'x5'6".

Forty discharge pontoons for U. S. Engineers, Rock Island, Ill.; 38'x14'x3"; 20 keels laid.

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7'; keels laid.

One barge for Heekin Can Co., Cincinnati, Ohio; 125 x 25 x 4 ft.

NASHVILLE BRIDGE COMPANY,**Nashville, Tenn.**

Purchasing Agent, Leo E. Wege.

Cathrine D., hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P., diesel engs.; keel May 15/28; launch Aug. 10/28 est.; deliver Sept. 1/28 est.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launch Jan. 1/29 est.

Hulls 151-152, two deck barges for stock; 100x24x5 ft.; keels May 24 and 28/28; launched and delivered June 23/28. Hull No. 153, dredge hull, 100'x30'x4'; keel June 17/28; launched and delivered July 12/28.

Hull 154, deck barge for stock; 120 L.B.P.; 30 beam; 7 loaded draft; keel July 5/28.

Hull 155, same as above; keel July 12/28.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft; keels Sept. /28 est.

Hull 161, ferry hull for stock; 150 L.

B.P.; 62 beam; 8 loaded draft.

Hull 162, deck barge for stock; 160 x 32 x 7 ft

Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft.

Hull 164, deck barge for stock; 120x30x7 ft.

Hull 165, same as above.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY**Newport News, Va.**

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy; 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launch Aug. 18/28 est.

Not named, hull 329, sister to above.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6 1/2" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox W.T. boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28.

THE PUSEY & JONES CORP.,**Wilmington, Del.**

Purchasing Agent: James Bradford.

President Warfield, hull 1035, night passenger and freight vessel for Baltimore Steam Packet Co., Baltimore, Md.; 320 L.B.P.; 56'6" beam; 15'6" loaded draft aft; 18 1/2 mi. speed; 1784 gross tons 2600 I.H.P., 4 cyl. triple expansion engs.; 4 Scotch boilers, 13'8" diameter; keel Sept. 20/27; launched Feb. 6/28; delivered July 12/28.

P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; keels July 9 est.; launch Sept. 1/28 est.; deliver Sept. 15/28 est.

THE SPEAR ENGINEERS, INC.,**Plant, Portsmouth, Va.**

Office, Bankers Trust Bldg., Norfolk, Va. General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel July 13/27; launched June 16/28.

Not named, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450 I.H.P. engs.; keel Feb. 18/28.

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WILMINGTON, CALIF.

SPEDDEN SHIPBUILDING CO.

Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 38' L.O.A., 6' 9" molded beam, 6' 9" molded draft, 31 DWT, 100 H.P. Standard diesel eng.; keel Aug. 15/28 est.; launch Oct. 15/28 est.; delivered Dec. 1/28 est.

STATEN ISLAND SHIPBUILDING CO., Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

SUN SHIPBUILDING COMPANY Chester, Penn.

Purchasing Agent: H. W. Scott

Sun, hull 110, motor tanker for Sun Oil Co.; 480 L.B.P.; 65' 9" beam; 37' draft; motive power not yet determined; keel Dec. 21/27; launched July 14/28; delivered July 27/28.

Hull 112, earloast for Reading Railroad; 200x34x79"; keel Apr. 30/28; launched July 12/28; delivered July 17/28.

Hull 113, same as above; keel May 1/28; launched July 24/28; delivered July 24/28.

Hull 114, same as above; keel June 15/28 est.; launch Aug. 9/28 est.; deliver Aug. 9/28 est.

Hull 115, same as above; keel June 29/28 est.; launch Aug. 11/28 est.; deliver Aug. 18/28 est.

TOLEDO SHIPBUILDING CO. Toledo, Ohio

Purchasing Agent: Otto Hall.

Hull 179, dump scow for Central Dredgeing Co.; 144 x 42 ft.

Hull 180, same as above.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Buildgong, hull 67, stern-wheel towboat for stock 64'9"x18'x4'5"; 100 H.P. Fairbanks-Morse diesel eng.; keel Mar. 30/28; launched June 11/28; delivered July 16/28.

Captain Eric Bergland, hull 68, towboat for U.S. Engineers, Vicksburg, Miss.; 64'9"x18'x4'5"; 100 H.P. Fairbanks-Morse diesel eng.; keel Apr. 16/28; launched June 28/28; delivered July 30/28.

Not named, hull 69, steam propelled towboat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Incor, hull 70, twin screw towboat for International Cement Corp., New York; 126x26x7 ft.; 2 Fairbanks-Morse 360 H.P. diesel engs.; keel May 18/28; launched July 17/28; deliver Aug. 15/28 est.

Hulls 71-72, two steel maneuver boats for U. S. Engineers Office, Pittsburgh; 60'x22x4 ft.; keels laid June 19/28 and July 9/28.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'7"x7 1/2'; 190 B.H.P. Winton diesel eng.

Hull 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army Engineers; 127'x30'x4'4"

Hulls 75-76, two stern-wheel towboats for stock; 64'9"x18'x4'5"; diesel eng.

Repairs

BETHLEHEM SHIPBUILDING
CORP., LTD.,
Union Plant,

Drydock, paint, misc. repairs; Vinland,

State Dredge No. 3, Frank G. Drum, F. J. Luckenbach, U.S.S. New York, Point Judith, Abrom. Manini, Manganui, American Star, J. C. Fitzsimmons, tug Morgan Shell, East Indian, Santa Fe barge, tug Sea Salvor, Harvard, Malolo, K. R. Kingsbury, Wilapa, Brookings, Necanicum, Ferry City of San Rafael, ferry Chas. Van Damme, yacht Elia (also remove and replace propeller, draw tailshafts for examination). Furnish 200 condensers tubes: San Melito, Make, and install 1 set of rings for H. P. piston valves: David C. Reid. Engine repairs: San Melito, David C. Reid. Dock, clean, paint: Pan American Barge No. 2. Pipe repairs: Oakmar, Socony, Vimeira. Propeller repairs: Abrom. Makiki, San Juan. Shell plate repairs: Acasta, Chiapas. Cut liners from tailshaft: Oleum. Windlass repairs: Manhattan Island. Forged steel lower section of stern frame: Frank G. Drum, Makawao. Misc. repairs: La Brea, Larry Doheny, Kekoskee, Sea Witch, Emma H. Coppage, W. H. Libby, J. W. Vandyk, Nordanger, West Ivan, Port Saunders, Lio, Restless, Hamlin F. McCormick, Watertown, Tascala, Omphale, San Jose, Providencia, F. J. Luckenbach, Manchuria, Manini, Limon, A. L. Kent, Makua, Makawao, Kenowis, Richmond, San Mateo, F. A. Douty, Mongolia, Bolivar, Silver Hazel, Esparta, Point Fermin, Admiral Schley, Almathus, Comeric, La Perla, California, H. W. Baxter, Hartwood, Point Loma, J. B. Stetson, Horace X. Baxter, Wm. A. McKenney, Borace.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Bow and bottom damage repairs; tail shaft inspection; stern bearing relined; Jas. B. Eads. Tail shaft inspection: Renvoyle. New wheel mounted: Manasoo. Bottom damage repairs: Brentwood.

MADISON MARINE WAYS Madison, Ind.

(Owned and operated by Howard Shipyards & Dock Co.)

Extensive repairs to hull; stmr. Rose Island. Electric weld leaks in hull: American Barge Line barge No. 30. General overhaul of hull: Robt. T. Graham.

THE MOORE DRY DOCK CO. Oakland, Calif.

Drydock, clean, paint, misc. repairs: stms. Hollywood, Buffalo Bridge, Tahoe, barge E. M. Phelps, tugs Hercules, W. B. Storey, Sea Scout. Dock, clean, paint, engine, deck dept. & misc. repairs: Grifidu, Wahkeena, West Tugus (also new section of stern frame). Dock, clean, paint, also damage repairs: stmr. Hyades. Cast and machine propeller blade: stmr. Glymount. Furnish propeller: Edna Christenson. Furnish propeller hull: stmr. Marsodak. Furnish tail shaft: Elinor Christenson. Misc. repairs: stms. Lubrico, San Pedro, Wellesley, Westport, Kalfarli, m.s. King Arthur.

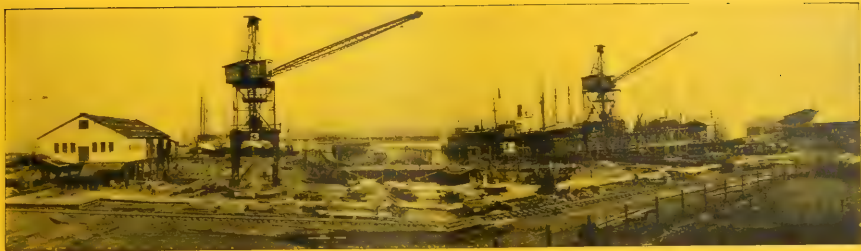
PRINCE RUPERT DRYDOCK & SHIPYARD

Prince Rupert, B. C.

Dock, clean, paint, tailshaft drawn for inspection, m.c. hull and machinery repairs: stmr. Canadian Farmer. Lined for grain loading: Anglo-Peruvian. Dock, clean, paint, misc. hull and engine repairs: 9 fishing boats. Misc. hull and engine repairs: 34 fishing boats. 65 other commercial jobs.

UNITED STATES NAVY YARD Bremerton, Wash.

Dock and misc. repairs: California, Reno, McCawley, Farragut, Percival. Misc. repairs: Idaho, West Virginia, Idaho, Omaha. Emergency repairs: Cuyama, Kanawha. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.



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Geo. A. Ames

President

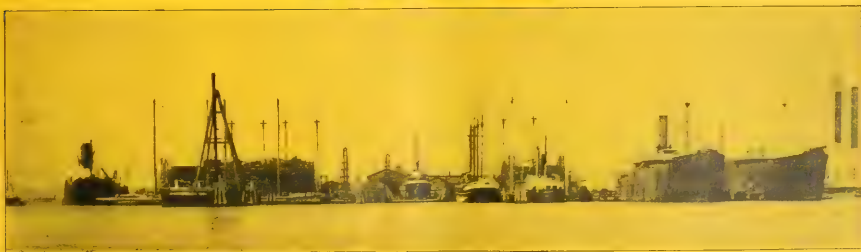
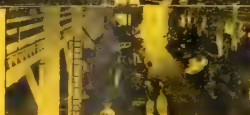
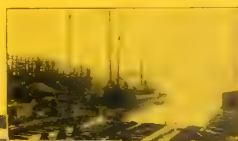
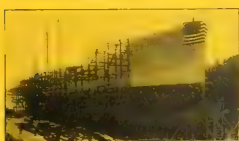
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Just put into service, the new Waialeale of the Inter-Island Steam Navigation Co. sets a new standard of speed and luxury in Hawaiian inter-island travel. She was built at Bethlehem's Union Plant on San Francisco Bay, is an ultra-modern express steamer, 310 feet long, and accommodates 314 passengers.

The Waialeale is a twin-screw steamer driven by 4,000 horsepower Westinghouse geared turbines. Chief Engineer Wagner of the Waialeale and Guarantee Engineer Miliken of Westinghouse reported after the steamer's first run

that everything worked perfectly. Mr. Miliken found the turbine gears in excellent condition and said that Shell lubricants used were satisfactory in every respect. Like hundreds of other steamers, the Waialeale uses only Shell lubricants, including turbine oil.

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Who's Who—Afloat and Ashore.

Edited by Jerry Scanlon

IF we should try to enumerate the many occupations that Mark H. Gates, the genial secretary of the San Francisco Board of State Harbor Commissioners, has engaged in you would be inclined to doubt the veracity of our statement.

When someone calls upon Major Charles H. Tilden, president of the Board of State Harbor Commission and one of the best known officials in California, for information, such as how many piles there are in a pier or what the highest water mark in San Francisco Bay was on a certain day twenty years ago, Major Tilden presses the buzzer and in comes Gates with the information at his finger tips.

We asked Mr. Gates his age after listening to the many occupations he was engaged in, and he told us he was 50 years old. He is the youngest looking man for his age we have ever seen. We expected him to say about 32 years old. Baseball, which he still plays, golf, and fishing are the hobbies of the genial secretary. "And don't forget," he admonished us as we were leaving, "that I am an inveterate gum chewer."

Born in Castroville, California, in 1878, Mr. Gates after attending grammar and high school, started his business career as a butcher boy. Then through the succeeding years he successfully engaged in the hay and grain business, shipping, rail-roading, music business, a newspaper columnist, baseball, managed a baseball team, handled conventions, was secretary to the mayor of Fresno, engaged in the paint business, was a real estate man. For eleven years, prior to his recent appointment to the Harbor Board, Mr. Gates was identified with the Bureau of Governmental Research as secretary-manager. Mr. Gates helped to organize this body.

More than 25,000 free meals, lodgings, and other forms of aid were provided sailors in 1927 by the American Seamens Friend Society in New York, the 100th an-



Mark H. Gates, secretary of the San Francisco Board of State Harbor Commissioners.

nual report of the organization shows. This volume of aid more than doubled the efforts of the Society in 1925 and 1927. Hard times among seamen of the New York waterfront were plainly evident.



Joe Sume, second engineer of the steamer Ecuador, snapped in a happy mood aboard ship.

Major James Fitzmaurice, Irish aviation ace and transatlantic flyer, has signed a \$100,000-a-year contract to do ship-to-shore flying for the North German Lloyd Steamship Company, according to Billings, Ward & Co., New York investment bankers. The service, according to announcement, is intended at present only for European ports of the line. Officials figure that this service would cut down sailing time of east bound vessels and expedite delivery of mail by 24 hours.

Announcement that the N.Y.K. liner Taiyo Maru would call at the port of Los Angeles on her voyage early this month has caused much speculation in Pacific Coast steamship circles as to whether or not the Japanese Company is going to make the southern port regular calls.

Bert Rinder has resumed his position on the Panama Mail dock, San Francisco, as assistant to port superintendent M. C. Johnson. Rinder occupied the post formerly under the late Captain Ryland Drennan.

The entrance channel of the Columbia river is better than ever before, according to a survey made by the United States engineers. The main ship channel is now 2500 feet wide with a minimum depth of 46 feet at mean low tide. The central part of the channel has a minimum depth of 48 feet of water over a width of 600 feet. There is a general entrance channel width of 7000 feet, a distinct increase of width between the 40 foot contours in the past year.

Work on plans for the construction of a dock on the west side of Portland harbor for the Texas Oil Company has been started by the Gilpin Company, it was learned here. The estimated cost of the dock is \$20,000.

A gain in lumber shipments from Oregon, Washington, and British Columbia of eight per cent has

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*S.S. Venezuela	Sept. 22	Sept. 24		*S.S. Ecuador	Sept. 15	Sept. 25	
*S.S. Guatemala	Oct. 6	Oct. 8		*S.S. Corinto		Sept. 28	
*S.S. Ecuador	Oct. 20	Oct. 22		*S.S. Colombia	Oct. 6	Oct. 16	
*S.S. Venezuela	Dec. 1	Dec. 3		*M.S. City of Panama		Oct. 19	

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York.

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been noted for the first six months of 1928, according to the Pacific Lumber Inspection Bureau. The total for this period was 2,901,931,480 feet.

A total of 233 vessels with an aggregate net tonnage of 495,866 were laid up in the principal ports of Great Britain and Ireland, according to quarterly figures, on July 1; 234 vessels of 363,355 net tonnage on April 1; and 202 vessels of 420,164 net tons on July 1.

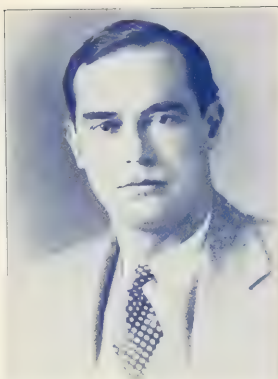
George Philippart has been named president of the Association of French Shipowners. Philippart was chairman of the board of directors of the Compagnie des Messageries Maritimes and of the Societe des Services Contractuels des Messageries Maritimes. With the Association he will assume the presidency vacated through the death of John Henri Dal Piaz. Maurice Tillier will replace Philippart as vice-president of the Comite Central des Armateurs de France.

Word of the death of Robert Stevenson, chief engineer of the Canadian Pacific freighter Beaverport, was received in San Francisco by friends. According to reports the late chief dropped dead in the ship cabin.

William H. Todd is chairman of the Neptune Association committee in charge of the international life boat race to be held on the Hudson river on Labor Day.

H. N. Nickerson, former assistant freight traffic manager of the Dollar Steamship Company, is now affiliated with the Alameda Airport. Nickerson for the past year and a half has been assistant to M. J. Buckley, freight traffic manager. Prior to that time Nickerson was connected with the Dollar organization as special representative at Genoa, Italy.

Two more modern motorships are to be built for Pacific-European trade under the North German Lloyd flag to augment the service of the two vessels now scheduled for this service. The name of one of the vessels to first enter this service will be changed from the Spree to the Havel. She is scheduled to depart Hamburg October 18 and arrive at San Francisco November 25. The Saale, first of the fleet of four, is due in San Francisco early this month.



Daulton Mann, general manager, Panama Mail Line, one of the more prominent of the younger steamship executives at San Francisco.

The Matson South Seas and Australian liner Ventura, which was speeded up on her last lap of the voyage from Sydney to meet mail contract tests, arrived at San Francisco seven hours ahead of schedule. The run from Honolulu was made in five days, 12 hours, and 12 minutes at an average speed of 16.7

knots. Captain W. R. Meyer is commander and C. J. Knudsen is chief engineer.

Stanley F. Mattoon of the shipping firm of Anderson-Mattoon, returned from an extended trip over Atlantic and Gulf ports, reports that the Cottman Company of Baltimore has named his firm as Pacific agents.

Five big American Mail freighters of the company's South China fleet inaugurate a new transpacific service at the ports of San Francisco and Los Angeles, according to announcement by the Dollar Steamship Company. The first port of call depends on the freight offerings while the vessels are homeward bound from China and the Philippines, according to announcement.

A new record for tolls collected and transits was set for the Panama Canal during the fiscal year ended June 30. The total number of transits for this period aggregated 6456, and the total of the tolls was \$26,944,499.77. This exceeds by 371 transits and \$713,476.83 a prior high record established in 1927.

The Board of Trade of the Swedish government handling the loan fund for the benefit of the shipping companies loaned six companies 1,500,000 crowns. The fund is maintained by the government and loaned at the interest rate of four per cent. No payment is required on the principal during the first two years of the loan, only the interest being paid. Thereafter one-sixth of the principal plus the interest must be paid annually. During the first six months of 1927 loans were requested by thirteen shipping companies and two were received later in the year. The fund was increased from the original sum of 5,000,000 crowns to 20,000,000 crowns.

The United States Shipping Board is "without jurisdiction" to act under allegations made by the Los Angeles Jobbers' Association on "split delivery," according to an answer filed by the Argonaut Steamship Line. A motion to dismiss the complaint was set forth in the answer. The Board already has denied two such motions for dismissal. Formal hearings are expected to be conducted by the Board but no official announce-



Captain Giovanni Prigl of the motorship Cellina, Libera Line. The General Steamship Corporation is Pacific Coast agent.

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ments have been made bearing on this point. Other respondents to the complaint are the Isthmian Steamship Lines, Panama Mail Steamship Company, American-Hawaiian Steamship Company, Arrow Line, California & Eastern, Dollar Line, Ocean Transport Company, Luckenbach Steamship Co., Panama Pacific Line, Quaker Line, Transmarine Corporation, Munson-McCormick Line, Williams Steamship Company, Inc.

Offices of the Dimon Steamship Company are now in the Oceanic building, 2 Pine street, San Francisco. In keeping with expansion of the organization is the appointment of George Hall, formerly with the American-Hawaiian and Luckenbach lines, as district freight agent. H. J. Gratton, formerly with the McCormick Steamship Company, is now with the claims department of the Dimon Company. Former offices of the company were in the Monadnock building.

At least one trip every four weeks or fifteen trips in a year for a period of five years from January 1, 1929, to December 31, 1933, with three vessels of 11,000 tons having a minimum speed of 17 knots, is the main point of the conditions imposed on the N.Y.K. Line for its Seattle service under the Japanese State subsidy. Westbound ships must call at Kobe, Moji, and Shanghai, while on eastbound trips vessels must call at Victoria or Vancouver on both voyages outward and inward.

Shipping officials of the Atlantic seaboard continue to mourn the loss of Commodore Sir James Charles of the Cunard fleet, who passed away recently at Southampton. The commodore died suddenly and almost within an hour of completing his last voyage before retirement from the service. He was in command of the Aquitania and was to have retired on his sixty-third birthday. Lady Charles, resident of Southampton, was with her husband when he died. News of the death of the noted commander caused much sorrow to friends and the Cunard officials. Flags were half-masted on all vessels of the Line and offices at the various ports. Hundreds of messages of condolence were received by Lady Charles. Commodore Charles commanded at various times the Lucania, Carmania, Mauretania, and Lusitania. Death came at the end



Charles Saunders, Jr., fourth officer on the Manoa, and his dad, Captain Charles W. Saunders, operating superintendent, Matson Navigation Company.

of his 726th voyage across the Atlantic.

Like father, like son. This is clearly illustrated in the career of Charles Saunders, Jr., son of Captain Charles Saunders, superintendent of the Matson Navigation Company. Young Saunders has a natural bent for the sea and today is fourth officer of the Matson ship Manoa. He is one of the youngest officers in the employ of the company.



Jack Armes, son of George Armes, president of the General Engineering and Drydock Company, who shipped aboard the Panama Mail liner Ecuador for his vacation period.

Three of the six mail routes over the Pacific for which tenders have been issued by Postmaster General Harry New, under provision of the Jones-White act, are out of San Chinese ports; and San Francisco to Colombo, Ceylon. These tenders Francisco. These are from San Francisco to Australia; San Francisco to Manila via Japanese and are among fifteen additional to those already awarded.

Captain J. W. R. Stewart, stevedoring and marine expert, is now assuming his new duties as assistant to Bryon O. Pickard, safety engineer of the San Francisco Waterfront Employers Association, the Pacific American Steamship Association, and the Shipowners Association of the Pacific Coast. Captain Stewart is well-known and popular on the waterfront.

Frank C. Sykes, member of the Board of State Harbor Commissioners at San Francisco, announces that the Board will ask the state to appropriate funds in the next budget for a new motor speedboat for harbor inspection and other work.

William Duncan has been appointed second assistant engineer of the McCormick freighter Munami by Chief W. C. Young.

Frank V. Frenz has been promoted to second engineer of the freighter Golden Forest, by Chief Engineer K. P. Townsend. Donald A. McLaren was signed on as the new third assistant.

Chief Engineer William W. Stirling of the recently acquired Panama Mail liner Guatemala, stated that he liked his first trip to the North Pacific Coast. He has been with W. R. Grace & Company for the last seven years. Most of his service with Grace was between New York and South America. He has sailed with Captain John Percival for three years on the Guatemala.

Other members of the Guatemala's engine room staff consist of Robert Hall, first assistant; Charles Cooper, second Assistant; and J. A. Carpmill, third assistant engineer.

Robert Curry, formerly first assistant on the Matson liner Wilhelmina, is serving as master of the vessel's propulsion department, during a lay-off of Chief Engineer John Anderson.

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On a seven months' tour of the world, which calls for visits to twenty-one ports, Hugh Mackenzie, general passenger agent for the Dollar Line, departed last month on the President Wilson. He will inspect the offices and agencies of the world, as well as conferring with travel bureau executives..

A party of officials of the Messageries Maritimes from France have recently been touring the Pacific Coast.

The party was composed of E. Gaudaire, R. Mathieu, L. Gichet, and R. Nocolle of the M. M. Company, and R. B. Bockelmann of the New York offices of the Compagnie Generale Transatlantique (French Line).

Seattle, Portland, San Francisco, and Los Angeles ports were surveyed by the executives. The fact that the M. M. Line executives were accompanied across the continent by an official of the French Line tended to forecast the fact that the two lines may enter into agreement for a round-the-world service after the fleet of vessels now building for the French Line's European-Pacific service are ready for service in 1929.

Captain B. Aillet, who is just back from a trip to France, made the trip in connection with the proposed alliance. Captain Aillet is Pacific Coast manager for the French Line.

The Messageries Maritimes is now operating a fleet of express passenger and freight liners out of Marseilles to Port Said, Colombo, Singapore, Saigon, Hongkong, Shanghai, and Kobe. The company operates the largest fleet of vessels under the French flag and some of the passenger vessels are among the leading vessels in this trade.

After serving for 55 years in the steamship business, James Parton, passenger manager of the London offices of the White Star Line and one of the best known and most popular travel men in Europe, has just resigned, according to advices received by Leo E. Archer, Pacific Coast manager for the Panama-Pacific Line. Mr. Parton has just reached the age of 75 years. He entered the service of the American Line Steamship Company in 1873, joining the Liverpool office. When the American Line absorbed the Inman Line in 1899, Mr. Parton was sent to the London passenger



Captain John Percival and Chief Engineer William W. Stirling of the Panama Mail liner Guatemala.

offices, where he remained until the formation of the International Mercantile Marine Company. In 1902 he was made London passenger manager, a position he held until his retirement.

Mr. Parton is succeeded by Matthew Workman and Mark Fothergill, who will handle the position jointly.

Set three months ahead of time, the sailing date from New York of the new Panama-Pacific liner Virginia, now building at Newport News, will be December 8 of this year, according to P.A.S. Franklin, president. The launching date was August 18. Sister ship of the California, the Virginia, will be one of the finest liners afloat. A third vessel of similar size has been contracted for by the Panama-Pacific Line and the Newport News Ship-



Captain Charles W. Hamma, popular master of the Lassco liner City of Los Angeles.

building Company will be the builders.

E. H. Cocke has been promoted to the position of assistant passenger traffic manager of the International Mercantile Marine Company, with supervision over first, second, and tourist third class business. His headquarters are in New York. Mr. Cocke joined the company in 1919, and his rise in the passenger department has been rapid.

A note of interest was called to our attention by J. Francis McMullen, the genial publicity director of the Panama-Pacific Line at San Francisco.

Mr. McMullen told us that the American flag that flies over the masthead of the giant liner California is the same that once flew over the finest and fastest transatlantic liners under American registry, the New York, Philadelphia, St. Paul, and St. Louis. Many people were of the belief that the flag disappeared from the seas with the withdrawal of the American Line from transatlantic trade five years ago, a withdrawal which Mr. McMullen hopes is only temporary. This same flag now fluttering from the masthead of the California will also play in the breeze from the masthead of the new liner Virginia and from that of the third liner to be built for the New York-California service of the Panama-Pacific Line, according to Mr. McMullen.

Drew Chidester, vice-president of the General Steamship Corporation, and Mrs. Chidester are on an extended trip to the Far East. The couple sailed from Vancouver aboard the liner Empress of Russia. They will be gone several months.

A. M. Dollar, head of the Canadian Dollar interests, is on a pleasure cruise of several weeks through British Columbia waters, aboard his yacht Rio Bonita. Among his guests is William C. Empey of San Francisco, publisher of the "Guide."

After an extended tour of the European shipping centers, E. J. MacMahon, traffic manager for Sudden & Christenson, is expected home within a week, according to advices received by Arthur Cahill, president of the Company.

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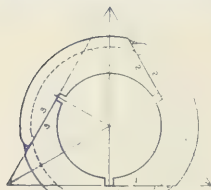
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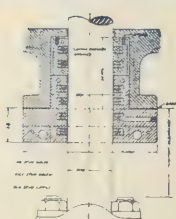
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Steamers	Gross Tonnage		
YUKON	1,863	REDONDO	1,130
ALASKA	4,618	ODUNA	1,474
VICTORIA	3,868	TANANA	3,474
ALAMEDA	3,158	DEPERE	3,474
NORTHWESTERN	3,094	DERBLAY	3,474
CORDOVA	2,273	DENALI	3,474
LAKINA	2,273	NABESNA	2,451
LATOUCHE	2,332	KETCHIKAN	2,373
		Total	50,843

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Trade Traffic and Shipping

(Section continued from Page 415)

Foreign Trade By Parcel Post

Amazing Growth of this Method of Transport During Past Eight Years

A study recently completed by the Foreign Trade Bureau of The Merchant's Association of New York has served to emphasize the fact that the International Parcels Post has become a highly important factor in the foreign trade of the United States. While the statistics assembled by the Bureau show that an increasingly large use is being made of this service each year, it is certain that many traders with foreign countries are not yet alive to all the changes the development of this modern system of shipments is bringing to that portion of the business world which concerns itself with international commerce.

Statistics indicate that foreign exporters have beaten the Americans to an appreciation of the possibilities of the service. A prudent regard for competition demands that the American exporter take careful stock of the opportunities offered him by the Post Office Department.

In the last few years this method of shipment has had an enormous growth. Since 1913 when the parcel post service of 47 countries was available to American shippers, the Post Office Department has completed negotiations with every important country and colony in the world, with the exception of Cuba, for parcel post service. Practical results of these efforts appear in the increasing volume of business conducted through the mails. In 1913, 2,831,512 pounds of merchandise was dispatched from this country by parcel post. By 1922, the parcel post exports had risen to 30,980,485 pounds and last year the figure jumped to 43,197,688 pounds.

When this service was first inaugurated 11 pounds was the common weight limit with the corresponding restriction as to the size of packages. At present approximately 86 countries and colonies have a weight limit of 22 pounds and one country, Germany, ex-

changes parcel post packages with the United States weighing up to 44 pounds. Shipments having a limit of 50 pounds may be sent to United States possessions.

Many concerns are using this service not only for the regular shipment of articles of small bulk and like weight, but also as an adjunct to the regular business in connection with the distribution of samples, repair parts, rush orders, advertising matter, and other merchandise of which a speedy delivery is desirable.

Perhaps the chief advantage of using the mails lies in the greater speed and promptness of this service as compared with other carriers. The manner in which the Post Office Department handles parcels, the routes over which they are carried, and the faster steamships selected to carry mails insure more rapid delivery to practically all parts of the civilized world of parcel post packages than is possible by freight. Special delivery service is available for parcel post in Alaska, Panama, Porto Rico, Philippine Islands, and Hawaii.

The most recent addition to the service is the air mail. This fast service is available not only in this country but also in almost all parts of Europe and in some parts of South America and is being extended rapidly all over the world.

In addition to the time factor, the great advantage of this method of shipping is that the post offices of every city and town in the country act as forwarding agents. To a great many shippers, especially those not located at shipping ports, this facility is not only a great convenience and a time saver but it is the simplest means by which merchandise of small bulk can be shipped. The use of the parcel post obviates the need for an agent in the port of entry as is necessary when making consolidated shipments composed of a number of small packages for several consignees.

For freight and express shipments to almost every country in the Western Hemisphere the exporter is required to fill out consular invoices and have them certified, or vised, at the consulate of the country of destination but very few countries require consular papers for parcel post shipments.

A maximum use of the parcel post enables the exporter to minimize the amount of paper work necessary for export shipments, to increase sales by the better service to customers in making deliveries, and to effect a saving in freight charges, consular fees, and forwarding costs.

Parcels may be sent C.O.D. to Mexico, Porto Rica, and Alaska, and in some countries packages may be registered. Shipments by parcel post can be insured against loss in the same way as freight shipments, and the government will insure when merchandise is consigned to Canada, Newfoundland, Ireland, and the United Kingdom.

Due to the variation in the postal regulations of foreign countries it is necessary for the exporter to make careful inquiry concerning the rules of the country to which he is proposing to ship. There is wide variation in this respect. Facilities available in one country are frequently not available in another. Certain articles may not be transmitted in any foreign country. The requirements vary as to packing, sealing, weight and size limits, postal rates, declaration forms, and consular documents. The sender of a foreign parcel post package may (and for some countries must) give instructions at the time of mailing that, if undeliverable as addressed, it is either to be tendered for delivery at a second address in the country of destination, treated as abandoned, or returned to sender.

Packages for some countries such as China, Ireland, Italy, Holland, and Newfoundland may be sealed. Other countries, including Argentina, Brazil, Chile, Ecuador, Sal-



That Hawaiian Musical Instrument —The Sea

IN Yeats' great lyric "Innisfree" he tells of "lake water lapping with low sounds by the shore." You who love such sounds will find them and others kin to them in Hawaii. The sea that makes islands of the pinnaled mountain range that rises from the floor of the Pacific, plays from an endless score.

There is the swish of the spray at Waikiki as you rush shoreward in a canoe, on a comber; the lap-lap of the water as you sit out a dance at the Royal Hawaiian Hotel; the diapason of the surf at Waimanalo, the gurgling ripple in the arc of Hanalei Bay; the booming of the sea heard over the golfing greens at Waialae.

Come on a Matson ship and you will feel yourself a part of Hawaii before you sight Diamond Head. The new Malolo will take you there in four days.

There are one or more Matson Liners from San Francisco to Honolulu every week, including the Malolo every other Saturday. Matson Line 21-day all-expense tours, \$286 up, except via the Malolo.

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vador, Great Britain, Mexico, Panama, and Soviet Russia, require that all parcels must be sealed.

In some of the Latin American countries, unfortunately, the parcel post is often the least desirable means of making a shipment and should be used to those countries only when specifically requested by the consignee. The Bureau of Foreign and Domestic Commerce has issued a booklet, written by Henry Chalmers, Chief of the Division of Foreign Tariffs, entitled "Preparing Shipments to Latin America," which presents in detail the conditions of shipment and delivery of parcel post shipments to each of the countries of Latin America.

The actual value of this service can only be determined by each individual shipper. Business houses

which have not yet considered this medium of transportation probably would do well to make a thorough investigation inasmuch as it is likely that the advantages and benefits which their competitors are utilizing may also prove to be an important factor in the increase of their foreign commerce.

Exporters in other countries, shipping to the United States make use of the postal mails to a far greater extent than do American exporters. In spite of the fact that the bulk of our imports consist of raw materials, and that our exports are largely manufactured products, exports by parcel post, including only commercial shipments valued at \$25 or more, amounted to \$7,195,000 for the first quarter of 1928, compared with parcel post imports of \$27,874,000 for the same period.

ing on the assumption that these trips will prove beneficial to the trade in general, and that they will promote a better understanding of the needs of our South American neighbors.

WORLD SHIPPING NEWS

Norway has passed a bill providing liberal loans at low interest for new construction in Norwegian shipyards.

An appropriation has been made by the Port Authority of Constantinople for bringing in a shipping specialist to reorganize the port system there.

A recent ruling of the **Secretary of the Treasury for Cuba** will force foreign steamship companies doing business there to pay 6 per cent tax on any profits arising from their Cuban business. A bill is now before the Cuban congress which provides a substitute tax of 3 per cent on the gross receipts from Cuban business, both freight and passenger. The steamship companies already pay 1½ per cent on gross receipts, 5 per cent on first-class tickets sold, and 2½ per cent on second class.

A recent strike of **seamen in Japan** was settled by a minimum monthly wage agreement with compensation ranging from \$40 for ordinary seamen to \$70 for carpenters and \$75 for quartermasters.

On the completion of the new Welland Canal the eastern terminal for the **Canadian Great Lakes shipping** will be located at Prescott, Ontario, and the Dominion government plans to spend \$4,000,000 in harbor improvements there.

Two high speed turbine liners, Bremen and Europe, building in Germany for the **North German Lloyd** were launched last month. These vessels are to be of 46,000 gross tonnage and are designed to wrest the blue ribbon of the North Atlantic from the Cunard liner Mauretania. This latter, by the way, though over 20 years old, is still occasionally breaking her own records.

British Board of Trade is carrying on, through its Scientific and Research Department, a series of commercial experiments with the use of powdered coal for fuel under marine boilers at sea.

In July the **Russian Soviet** suddenly appeared in the world's markets as a large buyer of grain, taking about a quarter million tons and causing diversion to Russian ports of considerable vessel tonnage.

A Constructive Foreign Trade Policy

WHEN the McCormick Pacific-Argentine-Brazil liner West Camargo sailed from San Francisco Tuesday, August 7th, on the first lap of her voyage to the East Coast of South America, she had aboard as passengers, Mr. R. W. Bybee, Manager of the McCormick Steamship Company's Foreign Department, and Mrs. Bybee. The vessel completely circles South America, proceeding direct to Buenos Aires via the West Coast of South America, through the Strait of Magellan, and from Buenos Aires to Montevideo, Santos, Bahia, Para, Puerto Colombia, returning through the Panama Canal.

Mr. Bybee will interest himself particularly in the further development of Pacific Coast trade with the countries of Argentina, Uruguay, Brazil, and Colombia; and for three weeks prior to sailing was conferring with Pacific Coast marketing associations, chambers of commerce, importers, and exporters, in regard to the investigations he will make.

Mr. Bybee, who is an enthusiastic amateur movie fan, has with him a small camera. He will take moving pictures of the vivid Avenida de Mayo in Buenos Aires, the excellent port facilities of Montevideo, and the vast coffee "estancias" of Sao Paulo. These pictures will be exhibited upon his return. He will also make detailed reports on the Argentine-Brazil markets and on medium of transportation probably would do well to make a thorough



R. W. Bybee, manager of the Foreign Department, McCormick Steamship Company.

investigation inasmuch as it is likely that the advantages and benefits which their competitors are utilizing may also prove to be uses of Pacific Coast products, such as dried fruits, canned goods, lumber, and paper, in these countries.

The McCormick Steamship Company, since its purchase of the Pacific-Argentine-Brazil line from the United States Shipping Board in 1926, has formulated a policy of having the "key" men in its Pacific Coast organization visit the South American countries served by this line. The company is work-

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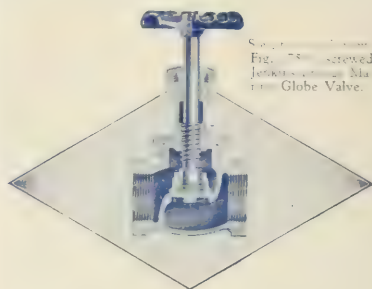


Fig. 780, screwed Jenkins Globe Valve.

Veterans of many voyages



Fig. 786, screwed Bronze Marine Angle Valve



Fig. 786, screwed Bronze Marine Horizontal Check Valve



Fig. 782, screwed Bronze Marine Angle Valve

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Freights, Charters, Sales

August 13, 1928

THE following grain fixtures are reported from the North Pacific to U.K.-Continent: a British str., 28/-, Sept.; a steamer, 28/6, Dec.; a Ropner str., 28/-, Sept.; Japanese str. San Francisco Maru, Aug., Kerr Gifford & Co.; British str. Sheaf Mount, 28/6 one port, 30/2 two ports, Aug.-Sept., Balfour Guthrie & Co.; a str., 28/-, Dec.; British str. Skipsea, 27/6, Aug./Sept.; British str. Langleford, 28/-; a str. Aug., Balfour Guthrie & Co.; British str. Benvannoch, 28/-, Sept./Oct., Kerr Gifford & Co.; British m.s. King Neptune, 28/6, Aug., Balfour Guthrie & Co.; British str. Langleford, 28/-, Aug./Sept.; a steamer, 29/-, Aug.; British m.s. King Malcolm, Aug., Balfour Guthrie & Co.; British m.s. King Neptune 28/6, Aug., Balfour Guthrie & Co.; British str. Anthea, 30/-, Aug., Continental Grain Co.; Japanese str. England Maru, 30/-, Sept., same charterers; British str. Riverton, 27/3, same charterers; Japanese str. France Maru, 28/-, Aug., Edward L. Eyre & Co.; a steamer, 30/-, Aug.; a Smith str., 28/-, Sept./Oct.; British str. 28/6, Oct./Nov.; British str., 29/6, Dec.; British str., 29/6, Dec.; British str., 29/6, Jan.; Japanese str. Kofuku Maru 28/-, Aug./Sept., Kerr Gifford & Co.; British str. Selviston, Aug., Kerr Gifford & Co.; Japanese str., 29/-, Sept./Oct., Balfour Guthrie & Co.; a Smith steamer, 28/6, Oct. Nov.; a steamer, 30/-, Sept.; British str. Hedgehope, Sept.; Strauss & Co.; British str. . . . City, 28/6, Oct. Nov.

The following steamers are reported fixed with lumber to Australia: American Sc. Helen B. Sterling, Columbia River to Adelaide, prompt loading; British str. Rio Azul, North Pacific to Port Pirie \$28,000 net, Sept., H. R. MacMillan Export Co.; Japanese str. Rozan Maru, Humboldt Bay and Grays Harbor to Melbourne, \$13, Sept., American Trading Co.

The American str. Lemuel Burrow is reported fixed from the North Pacific to North of Hatteras, \$14, September loading, by Blanchard Lumber Co.

The following lumber fixtures from the North Pacific to U.K.-Continent are reported: British str. Vulcan City, lumber, lump sum \$10,000, Aug., Canadian American Shipping Co.; British str. Sithonia, July, Canadian Transport Co.; Brit-

ish str. Paris City, North Pacific to U.K.-Cont., wheat and lumber, l.s. \$12,000, Sept. Oct., Tatham Bromage Co.; British str. York City, l.s., \$12,000, Aug. Sept., W. L. Comyn & Co.; British str. Goodwood, lumber and merchandise, Aug., Canadian American Shipping Co.

The British m.s. King William is reported fixed from the North Pacific to South Africa with lumber and merchandise, Aug. loading, by J. J. Moore & Co., Inc.

The following tanker fixtures are reported: German m.s. Adria, California to U.K.-Cont., 27/6, Aug.

Sept.; American str. Franklin K. Lane, California to North of Hatteras, 73c, Aug.; American str. Hadnot, California, to North of Hatteras, 75c, Aug.; American str. Watertown, California to not east of New York, 75c, spot loading.

The following time charters are reported: British m.s. Elmworth, Pacific trade, 6 months, delivery Colon, redelivery Australia, \$1.35, American Trading Co.; British m.s. Swanley, Pacific trade, 1 round voyage, delivery Los Angeles, July, J. J. Moore & Co.; British str. Bradfyn, British Columbia to North of Hatteras.

PAGE BROTHERS,
Brokers.

Safety For Marine Workers

(Continued from Page 347)

this federal act, nor are they included in the state acts).

Longshoremen's work consists largely of handling materials. These materials include practically every moveable known object and must be transferred from dock to ship, or ship to dock. Methods more or less peculiar to the industry are employed, but the major portion of the local cargoes is hoisted by

means of steam or electric winches.

The causation analysis for the first three months of 1928, covering accidents reported from San Francisco and Los Angeles harbors, shows that "falling objects" is the greatest cause of injury, according for 25 per cent of the whole. "Striking against or caught between stationary objects" is second, 22 per cent of the whole. "Struck by moving objects" and "falls of persons" are tied for third place, 12.5 per cent each. There are few instances due to failure of machinery or other mechanical devices, although when the ship or stevedore "gear" does fail, the resulting injury is generally severe and frequently fatal.

As the majority of accidents may be charged directly to the mental attitude of the workman and his immediate bosses, the prevention campaign to date has been programmed along the lines of creating a state of safety-mindedness in the shipping industry. Safety has been advertised extensively, with safety propaganda of all kinds distributed through all possible means. Many public meetings have been held, with open discussions. Frequent inspections of piers have been made by the safety engineer, and he is endeavoring to maintain continual friendly contact.

It is believed that the stage is now set for competitions, and the desire to make a record. A report has come in from one of the safety committees on one of the piers, stating that the members worked the entire month of May without a lost-time accident.

(California Safety News.)



A safety gangway on the deck load on the American-Hawaiian steamer Kansan. The planking is part of the deck load. Stanchions, cross bolsters, and braces are stored aboard and are part of the equipment of the vessel. This arrangement is being adopted as standard by a number of steamship companies.



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WHEN CLEAR - BURN BLUE LIGHT OR JACK AT FOREMAST

Ports of Hawaii

(Continued from Page 413)

most of its present business, and that is not at all certain.

Tourist Travel

Once Nawiliwili is completed a growth in tourist travel to Kauai is to be expected. It would not be surprising if the Matson Company and Los Angeles Steamship Company should route some of their larger passenger steamers to include a call at Nawiliwili during the week those vessels, the express liner *Malolo* excepted, remain in the islands. Of recent years the Inter-Island Steam Navigation Company has been assiduously fostering travel to Kauai, with such gratifying results that the company ordered the new steamer *Waialeale* from the Bethlehem yard at San Francisco. —That vessel, it may be remarked parenthetically, has made an excellent impression on the people of Kauai; and their reaction was all the more favorable because she is named for the dominating mountain of their island.—Kauai had been long neglected by travelers, rather strangely, too, for it possesses some extraordinary attractions, especially the magnificent Waimea Canyon, an astonishing gorge to be found on a tiny island; and everything the island has to offer is relatively easy of access. Since the explosive eruption of Kilauea in May, 1924, the island of Hawaii has ceased to be the Mecca that it was, inasmuch as Kilauea remains dormant and scientists can scarcely guess when its former lava lake will return; the tremendous pit of Haleakala on Maui must remain the objective of only the harder traveler until an automobile road is built up the 10,000-foot mountain; hence Kauai was the logical place to which travel could be diverted and stimulated. Nawiliwili therefore will be completed none too soon.

It is not improbable, too, that the harbor eventually will serve as a port for vessels seeking bunker oil, thus relieving the strain on the taxed facilities of Honolulu. Vessels will be able to enter and leave Nawiliwili in safety at night, which they cannot do at Ahukini. Finally, and not least in importance, the harbor will offer smooth water for seaplanes of the United States Navy, which have been greatly handicapped in making flights to Kauai. Their effective radius of action in working to the west of Pearl Harbor will be greatly increased. That fact alone, in the event of war, well might justify every cent expended on Nawiliwili by the federal government.

A glance may be given at the three other principal commercial harbors of Hawaii with a view to summarizing their present status and projected improvements.

Honolulu

Honolulu, it seems, might have been destined by nature as the capital and metropolis of Hawaii. It lies some fifty miles westward of the geographical center of the archipelago; and its harbor, even in early days, permitted it to wrest commercial and political supremacy from Lahaina, Maui, its rival, which had only a protected roadstead to offer to shipping, and lacked the fertility and salubrity of Honolulu. Prior to annexation the royal and republican governments of Hawaii, and after annexation the territorial government, had created a harbor 800 feet wide, 3500 feet long and at least 27 feet deep, with an entrance channel

200 feet wide and 35 feet deep. The harbor is an inlet in a coral reef and is protected by an island formed from dredgings. The United States government has increased the width of the channel to 400 feet, the width of the harbor to 1200 and its depth to 36; and has in hand the dredging of a 35-foot, "reserved channel" 400 feet wide and 3000 feet long toward Kapalama Basin. Part of this work has already been done by pineapple companies desirous of opening a waterway to their packing plants. The "reserved channel" will not only increase the harbor area of Honolulu, but will also extend navigable water far toward Pearl Harbor, which doubtless at some time will be given another entrance through Honolulu, so that the danger of the naval base being sealed up in time of war by blockade of its single existing narrow channel will be materially reduced. Honolulu now has twenty-six piers and wharves which are owned by the United States, the territory, and private interests. One additional wharf, in Kapalama Basin, is projected. In 1926 Honolulu handled 2,227,944 short tons of cargo.

Kahului

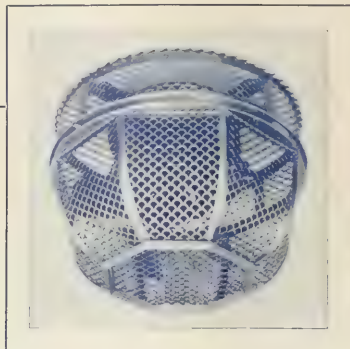
Kahului harbor, Maui, is about 94 miles eastward of Honolulu. It is an inlet, reached through a break in a coral reef, with a dredged basin about 900 feet wide protected by two breakwaters. Private interests had built a rubble mound breakwater 1800 feet long and had done considerable dredging before the government assumed the work, this at a cost of \$164,900; and the same interests have spent \$214,550 since the government adopted the project. Work is now under way on extending both breakwaters, which eventually will be 2850 and 2540 feet in length with a 600-foot channel between; and a new basin, 1450 feet wide, will be dredged to a depth of 35 feet in the lee of the west breakwater, all at an estimated cost of \$1,988,000. Two wharves have been built by the territory, and extensions will be made to each. In 1926 Kahului handled 348,756 short tons of cargo.

Hilo

Hilo harbor is situated on the eastern side of the island of Hawaii, about 200 miles southeast of Honolulu. Of the four principal harbors of Hawaii it possesses the fewest natural advantages, being nothing more than an open roadstead originally; and hence breakwater construction has been unusually extensive. In 1907 the United States provided for a breakwater to cost \$1,700,000; in 1912 provided for dredging; and in 1925 for extending the breakwater and for additional dredging. Work on both is now proceeding, at an estimated cost (revised in 1925) for new work of \$3,800,000. The breakwater, when completed, will be 10,170 feet long; and the harbor and channel will be 35 feet deep. Dredging will be completed in the summer of 1928; but work on the breakwater will continue. The territory owns two wharves at Hilo, one of which was recently extended. In 1926 Hilo handled 377,611 tons of cargo. This is a small amount for the principal port of an island that exceeds in area all the others of the group combined; but Hawaii has enormous stretches of completely desert land, and not all its commerce, by any means, passes through Hilo.

No attempt has been made in this article to discuss the numerous small ports of the islands.

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Pacific Marine Review

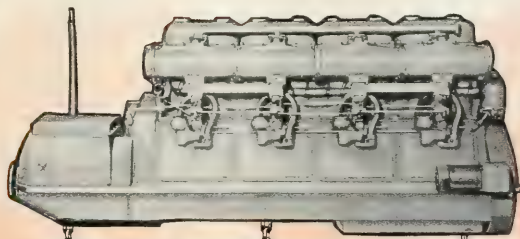
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Pacific Marine Review

The National Magazine of Shipping



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Association

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Official Organ
Shipowners' Association
of the Pacific

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Safety on Shipboard

DURING the first week of October there will be held in New York a great Safety Congress under the auspices of the National Safety Council. One of the most important departments of the Council is the Marine Section, and this section is having a large place in the program of the congress. Many interesting papers are to be read at this congress, and we are taking the liberty (since Safety should always be a first consideration) of opening this issue of Pacific Marine Review with a preview of some of the high lights of the program. Captain Charles A. McAllister, president of the American Bureau of Shipping, telling the congress about the "Relation of Classification to Safety of Ships," will say:

"The risks to which ships were subject in the good old days are described in the marine insurance policy as follows:

"Touching the adventures and perils which we the assurers are contented to bear and do take upon us in this voyage, they are, of the seas, men-of-war, fire, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart surprisals, takings at sea, arrests, restraints and detainments of all kings, princes, and people, of what nation, condition, or quality soever, barraty of the master and mariners, and of all the other perils, losses, and misfortunes that have or shall come to the hurt, detriment, or damage of the said goods and merchandises and ship, etc., or any part thereof."

At the International Shipping Conference, held in London in June of this year, the following statement was made: 'In the last fifty-five years British shipping has averaged 4,000,000 passenger miles per annum and 200 passengers have been drowned per annum, or one passenger to every 20,000,000 miles.'

There is no doubt travel on the high seas is becoming increasingly safer, and this is due in a large measure to the growth in size of ships, the change from wood to steel as a material of construction combined with the application of scientific methods to structural design, the change from sail to mechanical propulsion, to superior navigating equipment and aids to navigation, to government safety regulations, the licensing of officers and engineers, and last, but not least, to the beneficent influence of the various classification societies' rules and regulations.

We are by no means out of the woods yet when one recalls the mysterious disappearances at sea, with losses of all on board even within the last few years, of vessels which were seemingly swallowed up without any known or apparent cause.

There is no branch of engineering where the problems are so complex and varied as in naval architecture. Not only must the designer meet the requirements of the specifications with regard to deadweight, speed, fuel consumption, trim, maximum draft, etc., but due regard must also be paid to the regulations of the government inspection service and the construction rules of the classification society in which the vessel is classed.

The safety of the vessel herself and of the valuable lives aboard in the event of a disaster to the ship are essential considerations in the design of a passenger vessel, but ship design is peculiar in the sense that any policy of playing safe entails a serious economic handicap to the owner, for while sufficient structural strength must be provided (and the structural problem does not lend itself to exact mathematical treatment) any excess of hull material not only entails increased costs of construction, but must be carried around for the life of the ship, with resultant loss of cargo deadweight.

There is no commercial undertaking in the world today that is regulated to such an extent as the shipping business. This is due to the hazardous nature of the seaman's occupation in earlier days and in some measure to the fact that the shipping business is international in character and highly competitive.

William A. Tucker will tell the Congress a very interesting story of "Making Use and Abuse of Gauge Glasses," and remind them that "a gauge-glass, when performing its important duty of indicating the water level of a steam boiler, is subjected to the same steam pressure as the metal plates or tubes of the boiler. There is an instinctive impression in one's mind that glass is easily broken, but here we have a fragile looking glass tube resisting the highest steam pressure efficiently and safely.

Boiler room practice sometimes indicates the gauge-glass is not only sustaining the heat and pressure exerted by the steam and water throughout its length, but

overcoming the occasional or continual frigid blasts of wind issuing through an open door or window, which sudden changes break many a gauge-glass of poor quality.

Dickerson N. Hoover, supervising inspector general, United States Steamboat Inspection Service, takes up the theme "Personal Equation in Safety."

"In this country, probably more than in any other, we have come to believe, almost unconsciously, that all things can be corrected by legislation.

If a disaster occurs, the first thought is to pass a drastic law, to pass rules and regulations even more drastic, and then to go to bed at night and sleep, feeling that everything has been done that is necessary to be done, and that, in some mysterious way, this inanimate thing that we call a rule or a regulation will correct the condition which animate beings have failed to correct.

I wonder whether, when we indulge in such slumber, we are not doing a very dangerous thing. May it not be that the very perfection of the apparatus becomes, in the last analysis, its weakest element, because we look to that very perfection to do all things for us, when there must always remain something for us to do ourselves?"

The conclusion is that "No matter how perfect we make our devices, we must remember that we as yet must discipline ourselves. Man must control these inanimate slaves that he has made to serve him, and this can be done by eternal vigilance, by constant supervision, by constant drills of employees, as well as of people who are not employees. We must have competent men. I mean men who are disciplined, and who are under the direction of competent authority are taught absolute obedience, for it is by obedience and by self-discipline that we shall come to have that greater freedom and real liberty which is sought by all intelligent human beings."

Entente Practical

FOR several years the Liverpool Engineering Society has cooperated with the White Star Line and the American Society of Mechanical Engineers in a plan for giving to engineering students at Liverpool University an opportunity to get practical training in the engine rooms of transatlantic steamers and to obtain first-hand information of American industrial methods. Every week during the summer a student arrives at New York under this plan, twelve being given the opportunity during each summer vacation. This student on arrival is taken care of by the New York officials of the American Society of Mechanical Engineers and is shown the most interesting features of the engineering high lights in and near the metropolis. A movement is now on to send American engineering students to Great Britain under the same auspices.

This is a very practical expression of international fellowship and is producing many apostles of international goodwill. A similar plan might well be undertaken with mutual profit as between San Francisco and Kobe. The steamship lines are in operation, the engineering students are plentiful at both ends of the route, and there is certainly enough of industrial and engineering interest at each end to make interstudy and interdiscussion mutually profitable.

Let us hope that some such arrangement will be born out of the world's congress of engineers, which meets in Tokyo, October 1929.

The Skipper's Woes

The following poem was published in the Weekly Commercial News and Insurance Record, San Francisco, of March 18, 1891, and such was the demand for copies the edition was soon exhausted. There being many inquiries for it, the Record reprinted it on April 8, 1892. The text as here printed is taken from the latter issue. The verses are just as applicable today as they ever were.

Have pity, ye marine and local boards,
Ye little magnates—yea, most mighty lords—
On the poor skipper, for his lot is cast
Where fate unkind pursues him to the last.
Alas! poor man, his is an evil plight,
He's always wrong, he's never in the right:
Upon him, like a scapegoat must be thrown
The faults of others, not to say his own;
Disaster comes, and tho' 'twas not his fault,
'Tis plain the fellow is not worth his salt.
Should fog or currents put his reckoning out,
At once they ask, "What was the fool about?"
His ship is wrecked or by collision sunk,
Of course he has to prove he wasn't drunk;
If freights are low, who but himself to blame?
Jack's duff is spoiled, at once he says the same—
The beef all bone and innocent of fat,
Who but the skipper is to blame for that?
He shortens sail on some dark, stormy night,
Jack growls, and vows he did it out of spite.
Now he must teach the carpenter his trade—
Now show the sailmaker how sails are made;
In time of need he must be midwife, too,
Or help to kill, as other doctors do.
Should a poor sailor sleep his last long sleep,
He—parson then—consigns him to the deep;
And if he has a tear or two to spare,
He acts chief mourner, and bestows them there.
Well up in cooking, and in skill profound
At weighing tea and sugar by the pound;
Should there be strife or mutiny aboard,
He drops the scales and then takes up the sword;
And when the strife is over goes his rounds,
And—surgeon then—binds up the gaping wounds.
Now an astronomer, he views the stars,
Measures a distance 'twixt the moon and Mars,
A meteorologist we find him now,
Recording calms or winds—blow high or low.
Of course he's Euclid at his finger-ends,
Or, what is harder, knows all knots and bends;
Is cunning, too, at mixing paints and oils,
Takes everything in hand and nothing spoils.
Versed in exchanges—up in bills of lading,
And now a merchant, for his owners trading;
They praise him high, declare he is a gem,
The credit his—the cash all goes to them.

On board a steamer now, he scorns the wind,
But other cares oppress his anxious mind—
Of valves and pistons, cylinders and screws,
He knows, or ought to know, the names and use;
Surface condensers, steam and vacuum gauges,
Of coal combustion in its various stages,
Of salt in boilers and its incrustations,
Of screw propellers and side-wheel gyrations,
Of things in general—air, and sky, and sea—
A walking cyclopedia he must be,
Arrived in port, "Well, what's up now?" you ask;
They've found a little powder in a flask—
Fine him £5; and see—the careless dog—
Here's an omission in the official log;
Fine him again—the law must be enforced;
Some one must pay, so let him bear the cost.
Alas! poor skipper, if at sea you've trouble,
Arrived in port, you may perhaps have double.
You're fined for this because you didn't do it,
For something else because you never knew it;
Fined to the last, and turned from door to door,
To find you are not wanted any more.

—An Old Salt.

Post-War Trend of World Shipping

A Review of the Factors Affecting Marine Transportation During the Past Ten Years

By Norman F. Titus, Chief, Transportation Division,
Bureau of Foreign and Domestic Commerce.

VIRTUALLY all workable seagoing tonnage was lucratively employed for two years or thereabouts after the armistice was signed in November, 1918. Many ships were urgently needed for the transportation of troops returning to their homes, for the movement of foodstuffs and other relief supplies to devastated Europe, and for the carriage of delayed purchases to Latin America, the Far East, and other regions of the world. These regions had accumulated wealth during the conflict, but had been unable to satisfy many of their wants because the workshops of the world—Europe and the United States—had concentrated their efforts in the production of materials to meet war conditions. So, with these insatiable demands upon shipping, freights rose to unprecedented heights—an indication of which is disclosed by the average rates for steam tonnage on time charter in 1919 and 1920. These rates were greater by approximately 430 and 340 per cent, respectively, than the average for 1913. As a result, shipowners amassed enviable profits, but not for long. Toward the close of 1920, the transient requirements for tonnage had been more than met. Moreover, most of the merchant fleets of the world had been enlarged extensively and overseas trade had shrunk beyond all expectations.

Depression in Shipping

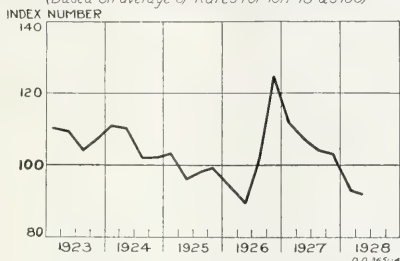
Once the return of troops had been effected, the movement of relief supplies to Europe accomplished, and the carriage of delayed purchases to Latin America, Far East, and elsewhere completed, shipping found itself in distress.

So acute became the situation that at the beginning of 1922 approximately 11,000,000 gross tons of shipping were laid up throughout the world. Perhaps not all of this tonnage was physically workable, but at least 75 per cent of it was. Hence, with the burdensome surplus of shipping and the diminution in the volume of cargo, the ocean-carrying trade became exceedingly unremunerative.

Postwar Recovery Slow

Apparently, very few shipowners realized that the recovery of overseas trade would be slow. New ships were ordered in excess of those for replacement purposes and, because of this and other factors, the world's supply of tonnage steadily increased until, on July 1, 1928, there were 61,508,000 gross tons of seagoing steam and motor ships in the world—this total being about 40 per cent in excess of the aggregate in 1913.

WORLD TREND OF FULL-CARGO FREIGHT RATE
(Based on average of Rates for 1911-13 as 100)



Curve showing the index to full cargo freight rates for the past five years.

In gauging closely the effect of this increase, it is necessary to make allowance for a considerable amount of obsolete shipping; moreover, it is necessary to consider the greater average speed and the increased cargo and passenger space of present day ships. In the main, however, it is apparent, without weighing these factors, that there is a large surplus of shipping.

Shipowners in many quarters have apparently regarded the postwar depression as the workings of a mere business cycle.

This depression, however, is the result of more than the workings of a mere business cycle. It is the reaction from a state of unparalleled dislocation of industry and commerce and other economic disturbances of this trade has a far-reaching influence on shipping, reasonably be expected.

General prosperity in shipping is still in the uncertain future; the present day outlook is not altogether encouraging. Substantial progress has been made toward the restoration of the industry on a stable basis. Oversea trade, although sluggish in some areas, has grown appreciably in volume during the past few years. As a result, the lack of balance between ships and cargo has become very much less pronounced. Idle shipping throughout the world has decreased and, on July 1, 1928, the total amounted to about 4,691,000 gross tons as compared with nearly 7,000,000 tons at the beginning of 1924. This decrease, although owing in part to the breaking up of ships, is attributable in no small measure to the absorption of ships into trade.

United States-European Trade

Trade returns indicate a decline in the relative importance of Europe as a market for our exports and as a source of our imports, but they indicate an increase in actual tonnage. The steady development of the United States as a manufacturing country, its growth in population, and the advancing standards of living have led to increased importation of raw materials and of tropical and semitropical foodstuffs—and these materials and foodstuffs come largely from noneuropean regions. The development of our manufacturers, also, has reduced our requirements of manufactured goods from Europe. The same causes have tended to decrease the relative importance of our exports of foodstuffs and raw materials, for which Europe is the principal market, and to increase exports of manufactures, which find less demand in Europe than in those continents which have thus far made little development in manufacturing.

However, despite the decline in the relative importance of our trade with Europe, that area by reason of its dense population of comparatively high purchasing power still holds preeminence in both our export and import trade. It is manifest, therefore, that the trend of this trade has a far-reaching influence on shipping. Fortunately this trend has been upward and although the rise has been gradual it has contributed appreciably to the welfare of shipping.

The total trade between the United States and Europe during the fiscal year 1926 was greater by 3,293,000 long tons, or 11 per cent, than in the fiscal year 1922. Imports into the United States were heavier by 5,383,000 long tons, or 122 per cent; whereas, exports from the United States were less by 2,090,000, or 8½ per cent. Among the principal commodities contributing to the increase in imports were coal and coke, clay, ore, iron and steel, potash and chemicals. Among the principal commodities responsible for the decrease in exports were grain and sugar.

Summary of Import, Export, and Total Tonnage

In the table I. there is given a resume of the import, export, and total tonnages exchanged between the various shipping districts of the United States and Europe during the fiscal years 1922 and 1927. The figures in the import columns represent receipts in the United States and the figures in the export columns represent shipments from the United States.

Present Situation

A review of world shipping by the Transportation Division of the Bureau of Foreign and Domestic Com-

OVERSEA CARGO TONNAGE BETWEEN SHIPPING DISTRICTS OF U. S. AND
EUROPE AND EUROPE

(Figures in thousands of long tons)

Shipping District	1922, fiscal year			1927 fiscal year		
	Imports	Exports	Total	Imports	Exports	Total
North Atlantic District and—						
United Kingdom	925	3,855	4,780	1,111	14,169	15,280
Belgium Europe	597	1,337	1,934	977	942	1,919
Havre-Lomburg Range	1,059	6,473	5,414	2,455	4,651	7,106
South Atlantic Europe	424	426	850	422	1,094	1,516
West Mediterranean	467	2,149	2,616	1,019	2,659	3,678
East Mediterranean and Black Sea	175	1,355	1,530	337	742	1,079
Total	3,587	13,355	17,442	6,305	23,416	29,721
South Atlantic District and—						
United Kingdom	10	165	175	22	458	480
Belgium Europe	3	107	110	25	78	103
Havre-Lomburg Range	124	267	391	323	151	474
South Atlantic Europe	1	30	31	12	32	44
West Mediterranean	3	62	65	4	47	51
East Mediterranean and Black Sea	1	30	31	2	1	3
Total	148	662	810	398	1,076	1,474
Gulf District and—						
United Kingdom	69	2,775	2,844	124	3,466	3,590
Belgium Europe	13	502	515	9	634	643
Havre-Lomburg Range	63	3,606	3,669	520	3,779	4,299
South Atlantic Europe	8	503	511	10	779	789
West Mediterranean	9	1,304	1,313	64	1,420	1,484
East Mediterranean and Black Sea	19	148	167	1	187	188
Total	200	8,636	8,836	731	10,417	11,148
Pacific District and—						
United Kingdom	103	1,046	1,149	71	1,745	1,816
Belgium Europe	10	51	61	52	68	120
Havre-Lomburg Range	127	334	461	459	562	1,021
South Atlantic Europe	2	37	39	5	50	55
West Mediterranean	2	94	96	10	126	136
East " and Black Sea	1	1	2	1	1	2
Total	244	1,567	1,801	566	2,653	3,209
Grand Total	4,879	26,415	28,794	8,017	36,804	44,801

Table I.

Table II. (Continued from page 1)

Country	In Thousands Gross Tons					
	July 1, 1922	July 1, 1925	July 1, 1927	Jan. 1, 1928	July 1, 1928	
United States—						
Imports—						
Coal and coke	3,767	2,225	2,650	2,371	2,471	
Iron and steel	1,077	51	31	41	52	
Grain	355	435	321	544	410	
Other commodities	13	25	22	22	22	
Exports—						
Coal and coke	4,053	3,927	2,964	2,995	3,059	
Iron and steel	1,125	1,070	651	569	739	
Grain	986	251	254	256	459	
Other commodities	203	92	91	80	114	
Imports from—						
United States	59	67	79	72	97	
Canada	52	69	64	54	95	
Great Britain and Ireland	160	64	3	15	46	
France	56	25	54	65	37	
Germany	16	75	33	43	10	
Sweden	68	28	—	1	15	
Belgium	40	13	9	32	—	
Other foreign countries*	165	254	77	55	47	
Grand Total	6,578	5,961	3,629	4,014	4,711	

*Refers mainly to shipments of lumber from United States.

Table II.

merce summarizes the situation at the present time as follows:

Some retrogression in the activity of shipping during the first half of this year was to be expected. It was hardly to be anticipated that the volume of overseas trade would exceed that of the preceding year or even equal it, in view of the carry-over of shipments to 1927, occasioned by the lack of cargo space and the high freight rates prevailing during the British coal strike of 1926. Nevertheless, it seemed unlikely that shipping generally would experience so dull a period as that with which it actually has had to contend.

The indications are that the slump is not the result of a widespread falling off in overseas trade, but rather of the overproduction of shipping. While overseas trade has been expanding gradually, new tonnage has been moving down the ways at a relatively fast pace. Apparently, shipowners looking forward to a larger growth in overseas trade and attracted by extremely low prices for new tonnage have been too eager in adding to their fleets. As a result the freight market has suffered a glut of cargo space and the return of shipping to prosperity has been delayed.

Whether a reaction will set in and a policy of conservatism be adopted remains to be seen. The rivalry in shipping today is unmistakably keener than ever before. Nations that previously displayed little or no shipping consciousness now are interested actively in developing merchant marines of their own. This inevitably is tending to impede the rapid recovery of the shipping industry.

Idle Shipping Increase

The returns showing tonnage laid up throughout the world at the middle of the current year are somewhat discouraging, revealing as they do a much larger amount waiting to be absorbed into trade than was the case a year ago. On July 1, 1928, the idle shipping of the principal maritime countries totaled 4,711,000 gross tons and exceeded that of a year earlier by 772,000 tons, or 19 per cent. The countries principally affected were: Italy with 165,000 tons, or 62 per cent more; the United States with 125,000 tons, or 4 per cent more; and Great Britain and Ireland with 47,000 tons, or 4 per cent more.

Further details are given in the succeeding table, which shows the status of various countries on specified dates back to July 1, 1925.

SEASONAL INDEX NUMBERS OF TONNAGE, FIRST QUARTER, JANUARY

1923, 1924, 1925

(Based on the average of 1914-1915 for 1911-1913 as 100)

Quarter	1923	1924	1925	1926	1927	1928
Jan-March	103	111	103	94	112	87
April-June	109	110	96	99	107	87
July-September	104	102	91	101	114	87
October-December	117	112	93	124	112	87

(1) There were no imports of coal from the United Kingdom during the first quarter, 1928; therefore, the index numbers for this period were based on the remaining available routes, as shown in the Transportation Division's table.

Table III.

Full-Cargo Rates Decline

The downward trend of full-cargo freight rates, which set in following the settlement of the British coal strike, continued without interruption throughout the first and second quarters of this year. In these quarters the world level of the rates, as recorded by the Transportation Division's index numbers, receded to 93 per cent and 92 per cent, respectively, of the 1911-1913 average, and approached the low marks reached in the first half of 1926. In striking contrast to these figures, the index numbers of wholesale prices obtaining in the principal maritime countries (which, in a way, may be taken as indicative of the expenditures of shipping) stood in the neighborhood of 140 per cent of their prewar average.

The world trend of full-cargo freight rates from January, 1923, to January, 1928, is shown in table No. III. and the chart.

Table IV. shows the full-cargo freight rates on six major commodities over twelve leading trade routes, as used by the Transportation Division in compiling its index numbers for the first and second quarters of 1928.

SEASONAL INDEX NUMBERS OF FULL-CARGO FREIGHT RATES, JANUARY, 1928

Commodity and route	First quarter, 1928			Second quarter, 1928		
	High	Low	Avg.	High	Low	Avg.
Coal:						
United Kingdom to River Plate	14	0	9	11	0	9
United Kingdom to India	9	0	3	10	0	6
United Kingdom to Port Said	10	6	9	7	6	8
United States to River Plate	14	6	12	14	2	13
Wheat:						
River Plate to United Kingdom or Continent	25	0	10	6	26	10
United States (Atlantic) to United Kingdom or Continent	2	9	1	8	2	6
Australia to United Kingdom	25	0	11	3	20	10
Lumber:						
United States (Gulf) to River Plate	9	10	3	10	9	10
United States (Gulf) to United Kingdom or Continent	115	0	110	1	100	110
Rice:						
Burma to United Kingdom or Continent	27	6	25	0	24	10
Sugar:						
Java to United Kingdom or Continent	1	1	1	25	28	0
Nitrates:						
Chile to United Kingdom or Continent	26	0	26	3	24	10

Table IV.

Tonnage in Existence Has Increased

The already abundant supply of shipping throughout the world was augmented during the year ended June 30, 1928, by somewhat short of 2,000,000 gross tons, or about 3 per cent. On that date there were in existence 61,508,000 gross tons of seagoing steel and iron steam and motor vessels, of 100 gross tons and more. This total exceeds by 18,994,000 tons, or 44 per cent, that on the corresponding date of 1914. These bare figures, however, are not entirely explanatory, since they do not show the relatively greater carrying capacity of modern shipping brought about by the use of oil fuel which is carried in double bottoms and by in-

creased speed and other factors which have made for higher efficiency.

Great Britain and Ireland led in the actual increase of tonnage during the year ended June 30, 1928; namely, 576,000 gross tons, or 3 per cent. Germany, however, was first in the percentage increase of tonnage; namely, 121½ per cent, or 420,000 gross tons. The United States fleet remained virtually the same size. These of France and Italy, in contrast, shrank slightly — by 100,000 tons (3 per cent) and by 48,000 tons (20 per cent), respectively. For further details note Table No. V.

Shipbuilding Has Declined

In line with the slump in full-cargo freight rates, shipbuilding activities throughout the world fell off during the first half of 1928. On June 30 the total tonnage of steel steamers and motor ships under con-

SEASONAL INDEX NUMBERS OF VESSELS OF 100 GROSS TONS AND OVER, BY COUNTRY, JUNE 30 (In thousands, gross tons)

Country	1914	1926	1927	1928
Great Britain & Ireland	19,674	19,237	19,155	19,731
British Dominions	1,421	2,074	2,050	2,332
United States	1,037	11,000	10,060	10,804
Japan	1,642	2,966	3,901	4,015
Germany	5,706	3,049	3,311	3,731
Italy	1,443	5,125	5,373	5,355
France	1,916	2,803	3,246	3,246
Norway	1,923	2,769	2,750	2,907
Netherlands	1,471	2,552	2,643	2,606
Other countries	6,918	7,223	7,591	8,580
Total	42,514	58,116	58,610	61,508

Table V.

struction aggregated 2,639,000, having declined by 184,000 tons, or 6 per cent, as compared with a year earlier. This reduction is accounted for entirely in the smaller tonnage of steamers under construction, as the tonnage of motor ships being built on June 30, 1928, exceeded that of a year earlier.

The oil-engined vessel continues to grow in popularity with shipowners and appears to have a wide field of employment before it. At the same time noteworthy progress is being made in the development of other types of propulsion, and it is impossible to predict what the situation will be a decade from now.

Great Britain and Ireland were affected most by the diminished activities in the shipbuilding industry. In fact, the reduction in the tonnage under construction there more than accounted for the total decline. Other especially noteworthy features besides this were the reductions in the United States from 144,000 tons to 45,000 tons, and in Italy from 226,000 tons to 154,000 tons, together with the increase in Russia from 74,000 tons to 115,000 tons.

Volume of Oversea Trade

The extent to which the volume of the world's overseas trade has expanded during the current year cannot be closely determined, as statistics are not available for some of the more important commercial nations. However, the following data for several of the leading countries are interesting and enlightening.

United States. Ocean-borne imports and exports combined, excluding oils, totaled 13,210,000 long tons in the first three months of 1928, the latest period for which figures are available. This amount was less by 1,241,000 tons, or 8½ per cent, than that of the first three months of 1927. Exports alone were responsible for the decrease, these having fallen by 1,499,000 tons, or 17 per cent. Imports, in contrast, increased 258,000 tons, or 4½ per cent.

France. Goods loaded and discharged at French maritime ports, during the first five months of 1928,

(Continued on Page 19, blue form)

Bridges Over Harbors

Port Authorities Always Consider Bridge Piers as Obstructions to Navigation and Detrimental to Merchant Shipping

THE Board of Supervisors of San Francisco is very actively appealing to Congress, against the decision of the United States Army Engineers and the Secretary of War, for permission to build a high level bridge over the busiest part of the San Francisco waterfront and the Port of San Francisco to connect by tubes under the approaches to the Port of Oakland with the east shore of the Bay of San Francisco at the City of Oakland.

Since the principal peace-time activity of the United States Army Engineers is to protect and aid commerce and navigation in our rivers and harbors, it would seem that ship operators and shipowners having interests in the Port of San Francisco should be vitally concerned in this matter.

Lochiel M. King, construction engineer of the Oakland Estuary Subway, and formerly for many years engineer with the San Francisco Board of State Harbor Commissioners, presented recently before the Traffic Association a very good resume and analysis of the Bay Bridge Problem. We are here reproducing that part of Mr. King's paper which deals with the objections, from the viewpoint of shipping, to high level bridges across busy harbors.

At the hearings on the bridge application held before the House Committee, General Jadwin, Chief of Engineers, made a strong argument against a bridge at this location, not on the theory of national defense, as the public have been led to believe, but for the protection of commercial shipping. We sometimes forget that the War Department is the governmental agency charged with the care and protection of the rivers and harbors of the country. This is the Army Engineers' major peace-time function and upon them rests the responsibility of protecting and aiding commerce and navigation.

General Jadwin pointed out that the harbor is not merely of local importance, but that it is of national importance to the commerce of the country. It is the only harbor on the Pacific Coast that is centrally located. It serves the whole country as far east, at least, as St. Louis and Chicago. As the countries of the Pacific develop, the commerce of the port of San Francisco is going to grow to such an extent that we will need all available space to care for the shipping.

Speaking of the tentative endorsement given the proposed bridge by certain shipping interests, General Jadwin says, "They have, however, regard to the present commerce, rather than to future commerce. We have felt, therefore, the responsibility of looking forward and seeing what might be needed to protect navigation in view of the probable future development of the country."

Governments of all countries protect their harbors against unnecessary hazards to navigation. As a result of this universal policy, there is not anywhere in the world a major harbor where the government has permitted the construction of a bridge over the main harbor.

As long ago as 1895, at Glasgow, when the demands of traffic became acute, and authorities refused a permit for the construction of a bridge, triple tubes were

built under the Clyde for vehicular and pedestrian traffic. At Hamburg, the port authorities refused to permit a bridge across the Elbe that might increase the hazards to shipping, and instead constructed twin tubes for vehicles. At London, no bridge has been permitted across the Thames below the Tower Bridge, which is at the head of deep sea navigation. In 1897, to facilitate traffic, they built the Blackwall tube, 27 feet in diameter and 6250 feet in length, for vehicular and pedestrian traffic. It proved so successful that in 1905 another tube, the Rotherhithe, was constructed under the Thames. This tube was 30 feet in diameter and 6880 feet in length. Both of these tubes have been in successful operation ever since and accommodate all manner of traffic, including automobiles, steam lorries, and horse drawn vehicles.

In New York, no bridge has been allowed across the main harbor. Bridges have been built across the East river, but the Hudson river is the main harbor, and when a crossing became imperative to care for the enormous vehicular traffic, twin tubes, the Holland tubes, 29 feet in diameter and 9250 feet in length, were built. A bridge is now being built across the Hudson for vehicular traffic, but at a point six miles above the Bowers, and the bridge spans from shore to shore without any piers in the channel, being a single span 3500 feet in length with a vertical clearance of 207 feet at high water.

At Liverpool, where it has been desired for years to have a crossing between Liverpool and Birkenhead, the port authorities and the British Admiralty have consistently refused a permit for a bridge. To satisfy the demands of traffic they are now constructing under the Mersey river the largest tube in the world, it being 44 feet inside diameter and two and one-half miles long. This is to be a vehicular tunnel with six lanes of travel on a double deck roadway. Construction was started in 1925, and the headings, one started from Birkenhead and the other from Liverpool, were "holed through" or connected in April of this year.

At Boston harbor, a bridge across the channel between Boston and East Boston has been agitated for years, but has met the consistent opposition of shipping interests and the War and Navy Departments. This year the legislature appropriated the money and authorized the construction of a tube for vehicular traffic. At present more than 2,500,000 vehicles per year are carried across the channel by ferries or make the circuitous trip around the harbor.

At Philadelphia they did construct the longest suspension bridge in the world across the upper part of their harbor. The span over the channel is 1750 feet wide. Last year there were seven vessels that could not pass under the bridge and had to unload upon lighters to get the cargo to its destination. Realizing their mistake, the proposed second bridge across the Delaware from South Philadelphia to Gloucester has been abandoned and they are now getting out plans to build a vehicular tube.

In Japan, where earthquakes are of almost daily occurrence, and where major shocks come at comparatively frequent intervals, high level, long span bridges

(Continued on Page 452)

Effect of Speed on Shipping Costs

Statement of National Council of American Shipbuilders

THE shipping world is watching with keen interest the effect that the Merchant Marine Act of 1928 is having on the development of the American merchant marine; but too short a time has elapsed since its enactment to disclose any immediate results.

The Shipping Board and Postmaster General have interpreted the act by ruling that the mail subventions to be awarded thereunder and its loan fund provisions should be used, as far as possible, to permit the building of larger and faster vessels than those now in operation. By this interpretation of the act they have emphasized the importance of shipbuilding in any attempt to establish and maintain an adequate and self contained merchant marine and, by requiring greater speed as a necessary feature of new vessels, they have presented one of the fundamental factors that determine the cost of building vessels.

While other features contribute to increase or to decrease the cost of a vessel, such as the requirements of the owner for economy of operation and for the comfort and safety of passengers and crew, yet speed is fundamental in the character of design and its effect on the cost of construction is immediate and far reaching. Foreign ship owners have been and are now building vessels of a speed greatly in excess of that which prevailed a few years ago. The tonnage and, especially, the speed of a vessel are the most important features that an owner has in mind when contemplating the construction of a new vessel, particularly if such a vessel is to be employed in competition with foreign vessels.

How much will it cost per deadweight ton to build a vessel of a certain tonnage and of a specified speed? This is the usual inquiry addressed to a shipbuilder by

Speed in Knots	10	12	14	16
Dimensions				
Length	415'	441.5'	468'	495'
Beam	55.5'	58'	61'	65'
Depth	36'	36.25'	37.5'	38'
Block-Coefficient	.80	.762	.725	.69
Shaft Horsepower	1900	3650	5800	9200
Finished weights in tons of 2240 lbs each				
Hull	3030	82%	3400	82%
Machinery	480	14%	750	18%
Total	3510	100%	4150	100%
Comparison in percent using a 10 knot ship as 100%	100%	118%	142%	175%

BUILDING COST

The cost of one ton of Machinery is approximately three times the cost of one ton of finished hull weight. The resultant relative cost will be as follows:-

Hull	3030	67%	3400	60%	3900	55%	4600	49%
Machinery	1440	33%	2250	40%	3240	45%	4725	51%
Total	4470	100%	5650	100%	7140	100%	9325	100%
Comparison in percent using 10 knot ship as 100%	100%	126%	160%	209%				

Table showing the effect of speed on the cost of a single screw, geared turbine, water-tube boiler, 26-foot draft steamer of 10,000 tons deadweight capacity.

a ship owner intending to purchase a modern vessel. If the shipbuilder's price is greater than the owner anticipated then he will question the reasons for the difference between the cost per ton of such a vessel and of another of an entirely different size and of less speed.

The measure of the value of a vessel cannot be determined by its cost per ton, without full knowledge of the elements of design. It is believed that the shipping world in general is unfamiliar with the marked effect of speed and of other characteristics of design upon the cost of a vessel. Exclusive of other factors, the cost per ton varies with the size, the number of decks, the draft, the coefficient of fineness, the deck machinery, the equipment, the passenger accommodations, the amount of refrigeration, the steam pressure, and the speed, the last item, speed, being the most important of all.

If the owner of a vessel of 10,000 tons deadweight and of 10 knots speed intends to build another vessel of the same deadweight but of 12, 14, or 16 knots, he will have to consider many factors that determine her cost. Thus each additional knot in speed requires an increase in horsepower; each increase in horsepower involves an increase in machinery weight; each increase in machinery weight requires a larger vessel to carry the machinery and the fuel for its operation. As a consequence, the cost of the ship will be increased for two principal reasons; because she is a larger ship, and because she requires heavier machinery.

Inasmuch as any increase in the speed of a vessel requires heavier machinery to develop the necessarily greater horsepower and as the machinery cost per pound is approximately three times the cost per pound of the hull, it will be seen that the total cost of the vessel of greater speed will mount rapidly although its deadweight tonnage will remain the same.

In order to throw light on this subject of the relation of the cost of a vessel and its speed the National Council of American Shipbuilders has obtained the information appearing on the accompanying table, which show the approximate increases in the size of a vessel, its weights and costs, when its speed only is changed and all other characteristics of the design remain the same.

The machinery weights include both propelling and deck machinery.

These tables show that a 16-knot vessel of 10,000 tons deadweight will cost more than twice as much as a 10-knot vessel; that a 14-knot vessel will cost 60 per cent more; and that a 12-knot vessel will cost 26 per cent more.

As the speed and horsepower of a vessel increase, a greater amount of fuel and feed water is required, with consequent additional weight imposed on the vessel and resultant decrease in its cargo capacity; both of which must be taken into account when vessels of high speed are considered.

The foregoing statement demonstrates the futility of comparing the cost of vessels on a tonnage basis alone, without carefully considering speed and all other factors that determine cost of construction.

Diesel Reliability Demonstrated

Sulzer Engines on Motorship Aorangi Show Remarkable Sustained Economy

ON June 15, before the meeting of the Oil and Gas Power Division of the American Society of Mechanical Engineers at New York, Oliver F. Allen read an interesting paper on the present status of the diesel. The following extract from this paper has reference to the Aorangi, the largest motorship on the Pacific Ocean, and shows the remarkable reliability and sustained economy of her prime movers.



The motorship Aorangi running into Vancouver harbor; four 3000-brake horsepower Sulzer-Fairfield engines; 18,500 gross tons; 18 knots; 46 tons of fuel a day.

Mr. Allen says in part:

Very little reference has been made to fuel economy, chiefly because the improvements in fuel consumption are not of great magnitude and are of minor importance compared with the design problems, the solution of which produces diesel engines giving reliability and continuity of service equal to the best steam and hydraulic plants and those which will effect reductions in weight and increases in rotative speed essential to the expansion of all kinds of applications and especially those concerned with transportation. I will, however, give one example of what a motorship is doing. No doubt there are many other equally good examples, but I have selected this one because James Smith, superintending engineer of the Union Steamship Company of New Zealand, when passing through this country on his way to England a few weeks ago allowed me to copy some data from his personal log book and has authorized me to give it to you. It is, therefore, first-hand, accurate information secured from the owners.

These data refer to the Aorangi, which vessel was built by Fairfield in Glasgow and has four 2-cycle, 6-cylinder, 3000-3600 brake horsepower Sulzer Bros. engines. The Aorangi has made over 300,000 miles in the Pacific service between Vancouver and New Zealand. Up to the end of 1927, when the engines were first overhauled, her performance had been as follows. (Figures refer to English long tons and Imperial gallons).

Total distance, knots	201,043
Average speed, knots	16.44
Total fuel, propelling, tons	23,359
Other purposes, tons	4,891
In port, tons	2,605
Engine hours	12,224
Average propelling, indicated horsepower	14,710
Average fuel per day, propelling, tons	45.8
Other purposes, tons	9
Average fuel per indicated horsepower, lb.	0.29
Total lubricating and cylinder oil first year, gallons	41,749
Total lubricating and cylinder oil second year, gallons	28,542
In port first year, gallons	2,652
In port second year, gallons	1,550

Per day first voyage, gallons	294
Average last four voyages, gallons ..	110
Average speed three best voyages, knots	17.1
.....	16.96
.....	16.88
Highest daily speed, knots	18.1

Now after going about 300 000 miles, the fuel per indicated horsepower on the voyage of December, 1927, was 0.311 pound, and for January, 1928, 0.315 pound.

Mr. Smith showed me the log of fuel consumption for a large number of voyages and it is amazing how little variation there is in the amount of fuel per voyage. The systematic and regular way in which this ship behaves in the matter of reliability, low maintenance, and uniform economy of fuel and lubricating oil is certainly a strong argument in favor of diesel propulsion.

Bridges Over Harbors

(Continued from Page 450)

are not considered safe or practical in withstanding heavy earthquake shocks. When a crossing of the channel between Shimonoseki and Moji became necessary to accommodate the heavy railroad traffic, a tube under the channel was decided upon. The channel here is 50 feet deep and one mile wide.

Coming nearer home, the Estuary tube under the channel between Oakland and Alameda was built because shipping interests strenuously opposed having any bridge across the inner harbor. Bonds had been voted for the construction of a bascule bridge, but with the opposition of the shipping interests to any bridge, these bonds were cancelled and new bonds to the amount of \$4,500,000 were voted for a tube. This tube from surface to surface is 4436 feet in length and is 37 feet in diameter. On the Alameda side it rests on soft bay mud more than 100 feet deep. Before construction was undertaken eminent geologists made careful study of the strata, particularly with regard to earthquake hazard, and pronounced it safe. The structural features of this tube are now complete, the ventilating machinery is now being installed, and the tube will be opened to traffic this month.

Recent Rulings Under the Merchant Marine Act

Important Decisions of the United States Supreme Court Affecting the Jones Seamen's Act

By Gregory Hankin, Director,
Legal Research Service, Washington, D. C.

THE Jones Seamen's Act gives to merchant seamen injured in course of employment the same rights to recover damages as are given to railroad employees under the Federal Employer Liability Act; and in case of death, the administrator has the same right of action as is provided for administrators of railway employees.

Fellow Servant Doctrine Abrogated

At common law an employer was not liable for injuries sustained by an employee through the negligence of a fellow servant. The Federal Employers' Liability Act abrogated this fellow servant doctrine and allowed recovery in the case of railroad employees. And when a stevedore was injured through the negligence of a winchman who left a winch unattended and in such condition that it started automatically, the Circuit Court of Appeals held that he could not recover under the Jones Seamen's Act. But the Supreme Court reversed the decision holding that the fellow servant doctrine no longer applied.

Seamen Assume Risks of Employment

In addition to abrogating the fellow servant doctrine, the Federal Employers Liability Act abrogated in part the defense of contributory negligence. But the Act left intact the defense of assumption of risk. In two cases which came before the Supreme Court recently, the lower courts had held that the seamen had assumed the risks which resulted in their death or injury. In one case a longshoreman, who was stowing a cargo of pilings aboard a barge, was struck and killed by a plank used as a platform upon which the piling was landed. The state Supreme Court held that the employee had assumed this risk even though the employer was negligent. In the other case a stevedore, employed in loading bars of copper, was injured, having slipped on a grease spot on the floor of the hatch where he was working. Before the injury occurred, the stevedores had noticed the grease spot and called it to the attention of the gangwayman. The latter told them to go on working and that sawdust would be sent down. The Supreme Court of the state held that since the employee knew of the negligent condition, he continued to work at his own risk. In both cases the Supreme Court declined to review the decisions of the state courts.

Act Does Not Give Remedy Against Ship

Most of the problems arising under the Jones Act, though somewhat analogous to those arising under the Federal Employers Liability Act, yet bear a maritime aspect. Thus the question arose whether under this Act, a seaman could maintain an action against a ship, rather than against the owner of it. The Act is silent on this point, but provides that "jurisdiction in such actions shall be under the court in which the defendant employer resides or in which his principal office is located." The Court interpreted this provision to mean that an action cannot be maintained against the ship, but must be brought against the employer.

Negligence of Employer Must Be Proved

As in the cases arising under the Federal Employers

Liability Act, so under the Jones Act, the negligence of the employer must be proved. In the case of a seaman who drowned in a storm on the Great Lakes when his boat sank, the Circuit Court of Appeals held that the accident was not due to the negligence of the employer, and his widow therefore could not recover damages. The Supreme Court declined to review that decision.

Liability May Be Limited by Harter Act

The extent of the employer's liability under the Jones Act, however, is further affected by the Harter Act, limiting the owner's liability to the amount of his interest in the vessel and her freight. In the above case of the seaman who was drowned, the lower courts also held that the owners were entitled to a limitation of liability, since no negligence was attributable directly to them. But in the case of an engineer who was killed by an explosion of a gas bag on a ferry boat, the negligence of the owners was presumed from the circumstances of the explosion, their petition for a limitation of liability was denied by the lower courts, and the Supreme Court declined to review the case.

Conflict Between State and Federal Jurisdiction

Under the Federal Employers Liability Act, the question often arises whether the employee at the time of the injury was engaged in interstate or in intrastate commerce in order to determine whether the employee's proper remedy is under the Federal Act or under the State Workmen's Compensation Law. This conflict between state and federal jurisdiction is even more pronounced in the actions brought for death or injury of seamen.

State Law Applicable Where Injury is on Land

It is established that where the employment is non-maritime in character, and the injury occurs on a vessel, or where the employment is maritime and the injury occurs on land, recovery may be had under the state compensation laws. A stevedore working on a wharf was struck by a loaded sling, knocked off the wharf and was later found dead in the river. The Court held that the widow could recover damages under the state law. A ship's carpenter was injured while working on a tug boat in the company's repair yard, and later died on account of those injuries. His widow was allowed to recover under the state law, because at the time of the injury the boat had been pulled up on a ways out of the navigable waters, and the Supreme Court declined to review the case.

Rule Excluding Remedy Under State Law

It is only where the injury occurs on navigable waters, and the contract of employment is maritime in character, that recovery under the state act may be excluded. The reason for excluding remedies under the state laws in such cases is that the state law then becomes a burden on navigation or it disturbs the uniformity of the general maritime jurisdiction of the United States.

Exceptions to the Rule

Yet, even in cases where the contract of employment is maritime and the injury occurred on maritime wa-

ters, recovery may be had under the state law, if the facts present a situation of local concern and do not materially effect the general maritime law.

In the case of a man who was employed in California to go on a fishing voyage to Alaska, during which time he was to work as a seaman, fisherman, and common laborer, recovery was allowed under the state compensation act for injury he received while putting away his fishing boat for the winter. Here, the injury occurred on navigable waters, the contract of employment was maritime, but the Court held that under the circumstances of the case, the decision of the state court allowing compensation under the state law did not materially affect the general maritime law.

Suit was brought to enjoin the Department of Labor and Industry of the State of Washington from applying the State's Compensation Act to workers employed in making up and breaking up rafts of logs on navigable waters. The State argued that the timber industry, as the great industry of the state, required regulating, and that this Compensation Act was within the state's proper exercise of its police powers. The Court held that this work was purely local in its nature and that its regulation by the state would work no material prejudice to the general maritime law.

A dredge was used on a navigable river for loading sand and gravel on barges. It capsized, and the man in charge, a federal licensed pilot and employed as pilot and captain, was drowned. His widow brought action under the State Workmen's Compensation Act against the employer and his insurance company. The case presented the following elements: The sand and gravel dredged were sold within the state; the state compensation law contained an elective provision; it was maintained that in view of this elective provision the employers had insured themselves against such losses, and the insurance company was made a defendant in the case. The Supreme Court of the state held that, under the circumstances, the employment was so purely local in its nature that its regulation by the state statute would not work material prejudice to the general system and uniformity of maritime law. The Supreme Court denied a petition to review the case.

Penalty for Wrongful Discharge in Lieu of Contract Right

In addition to the benefits of the Federal Employers Liability Act, the various laws of the United States provide additional protection and relief to seamen. One of the laws provides that if a seaman is wrongfully discharged before his voyage commences or before one month's wages are earned, he shall be entitled, in addition to the wages earned, to a sum equal to one month's wages. A seaman was wrongfully discharged and was paid this additional penalty. He then brought action to recover damages for breach of contract of employment. The Court, however, denied recovery holding that the penalty provided in the act was in lieu of and not in addition to the rights he had under the common law for breach of contract.

Limitation of Double Penalty for Delay of Wages

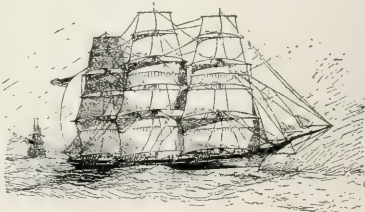
Another provision of law is, that upon discharge the seaman must be paid off at the time of the discharge or within two days after the shipping agreement expires, whichever comes first. Any master or owner who refuses or neglects to pay promptly is liable to the seaman for two days' pay for each day of delay, until the entire amount due is paid. But where a master's refusal to make prompt payment was due to an honest

mistake on his part, the Circuit Court of Appeals held that the seamen were not entitled to the double penalty. In this case the seamen were ordered to sail on Christmas day. They refused, on the ground that this was contrary to a promise made to them. Upon discharge they demanded their wages. This the captain refused and logged them as deserters. He did that being under the impression that the seamen had agreed to work for six months, whereas actually they had signed up only for the voyage. The seamen petitioned the Supreme Court to review the case on the question whether the mistake of the captain absolved him from the penalty, but the Court declined to go into the matter.

Of course, provisions such as these, are likely to lead to abuses. In most cases each side thinks that it is right, and if suit is brought to recover the double penalty, there are many ways of delaying the trial, allowing the double penalty to accumulate. The United States District Court in Norfolk, Virginia, adopted a rule to prevent such abuse. The rule gave precedence to all suits for seamen's wages and imposed a duty on the complainant to call the case for trial not later than ten days after the defense is filed; "in default whereof no wages or penalties shall accrue after said ten days." This rule was first applied in a case where apparently both sides were guilty of delay. But it was only after the decision was affirmed by the Circuit Court of Appeals for the Fourth Circuit, that this rule was promulgated by the District Court. The seamen petitioned the Supreme Court to review the case questioning the retroactive validity of the rule, since it was applied before it was promulgated. But the Supreme Court declined to review the case.

Prohibition Against Advances to Seamen Limited

A third provision of law prohibited advances of wages to seamen. Seamen had long complained of abuses which resulted from this practice, in consequence of which this provision was enacted into law. In a case recently decided, the question arose whether this prohibition applied to advance of wages made by a foreign ship while in foreign ports. In this case seamen were hired in England for a voyage to the United States and back. They were advanced part of their wages. When the vessel arrived in this country, the seamen demanded one-half of their wages without deducting the advance payments, claiming that these were invalid. Upon refusal, they brought action. It was argued by the seamen that the vicious practice of engaging seamen through the lure of advance payments would continue, if such advances were recognized. The Court held, however, that the law did not apply to such advances and that these may be deducted from the seaman's wages while the vessel is in a United States port.



Fine New Motor Tanker

THE Sun Shipbuilding & Drydock Company, Chester, Pennsylvania, has recently delivered a fine motor tanker to the Sun Oil Company. This vessel, named Sun, is of the two deck type, built with straight stem and semi-elliptical stern on the longitudinal system of construction. In general her design follows the arrangement which has become practically standard for American oil-carrying vessels. Her general characteristics are as follows:

Length, over all	497' 0"
Length, between perpendiculars	480' 0"
Beam, moulded	65' 9"
Depth, molded upper deck.....	37' 0"
Depth, molded second deck	24' 6"
Draft loaded	27' 2"
Deadweight carrying capacity, tons	13,400
Designed shaft horsepower.....	2,800
Fuel oil capacity, tons	611
Capacity of main cargo tanks, gallons	3,908,633
Capacity of summer tanks, gallons	893,587
Dry cargo capacity, cubic feet	48,597
Speed, knots	11

There are twelve pairs of main cargo oil tanks, each 24 feet in length, and in each tank one transverse frame is fitted and three vertical webs on each side of the center line. Six summer tanks are arranged in the 'tween decks, port and starboard, for use in the transport of light oils. The main 'tween decks are 12 feet 6 inches deep, and the expansion trunk is 30 feet wide. A general cargo hold is located immediately aft of the fore peak, and

has a suitable hatch fitted with steel hatch cover. Each of the main and summer cargo tanks is fitted with a 6x4 oil-tight hatch with coaming 30 inches high.

Special attention has been given in the design of this vessel to comfortable quarters for crew and officers. Between the upper and second decks aft accommodations are provided for oilers, wipers, seamen, and quartermasters in comfortable two-berth rooms. This arrangement will make it possible to change watches without disturbing those off duty. For the engineering staff's quarters and for mess rooms and galley, ample provision is made in the poop deck space. Deck officers are quartered in the midship deck house and the captain's quarters and office are arranged on the boat deck aft of the chart and wheel house as usual.

Propulsion machinery

The Sun is driven by one 4-cylinder, Sun-Doxford, opposed piston, fully reversible oil engine of 2800 shaft horsepower at 80 revolutions per minute. Each cylinder is 28.62 inches diameter and 2 by 45.66 inches stroke. This engine, directly connected to a single screw, works on the two-stroke cycle with high pressure solid injection of fuel.

A heat exchanger is installed which utilizes the heat of the exhaust gases of this engine to keep the temperature of the water in the ship's boilers at such a point that steam can be very quickly raised without causing undue stress in tubes or headers. The heat from this exhaust gas heat exchanger is

also used for heating the ship and for steam for various purposes at sea. One Babcock & Wilcox oil-burning boiler, with 3990 square feet of heating surface, is fitted in the after part of the engine room to provide steam for cargo heating coils, steam cargo pumps, steam capstans, steam windlass, and steam cargo winches.

For electric auxiliary power and electric light, there are two diesel engine driven 75-kilowatt General Electric generators and one 20-kilowatt General Electric generator. All of the auxiliary machinery on the ship, with the exceptions noted above, is electrically operated. The steering gear is of the Sun Shipbuilding Company's right and left hand screw type operated by a 35 horsepower direct-current motor geared directly to the screw shaft and controlled by the Ward-Leonard system from the pilot house.

A 2-ton Brunswick direct-expansion ice machine, driven by a 5-horsepower motor, provides ample capacity for refrigeration and for ship stores. A Griscom - Russell evaporator and a Davis feed water heater provide modern water service for the steam plant.

Particular attention has been paid to the purification and conditioning of lubricating oil and engine fuel oil. A battery of tanks is fitted and so arranged that the oils are undergoing a very thorough and continuous purifying process. Two Sharples vapor-proof closed-type centrifuges are fitted in line with these tanks for removing all grit, water, and heavy solids from the oil.





Workboats and Their Power Plants

Boat and Engine Builders of the Northwest

Turpel's Shipyard and Ways, for some forty years a land-mark at Victoria, British Columbia, where many coast craft have been built, has been sold to the **Point Hope Marine Railways, Ltd.**, of which Captain W. E. Gardner and W. G. Maury are the principals. Captain Gardner was for many years associated with the **Island Tug and Barge Co.** of that port; Mr. Maury was yard foreman for the Turpels at time of transfer. Under the new owners, the yard is very busy on repair work, the ways having had only two or three idle days for months. The plant will be modernized in every particular and, as a splendidly fitted machine shop is adjoining it, all kinds of work can be handled, both wood and iron.

The Island Tug & Barge Co., of Victoria, of which Captain Elworthy is manager, has been very busy hauling barges and lumber rafts, in addition to general towing work. The company is just beginning its new boom boat, the **Island Scout**, which has a **Fairbanks-Morse**, 35-horsepower diesel unit installed, giving her fine towing ability. The fleet of five vessels



The schooner *Star of Oregon* launched in 1841; first workboat built in the Pacific Northwest.

are all in good shape and increase in business indicates possibility of additions being needed.

The Victoria Tug Company, with headquarters at Victoria, keeps a fleet of six vessels steadily employed in various towing work on Vancouver Island waters. The big tug *Strath* has given great satisfaction to her owners, running almost

continuously since entering commission about two years ago. Captain McGregor reports business as very good and it is anticipated that within another year a larger and more powerful tug than the *Strath* will be added.

Washington Iron Works of Seattle is said to hold the record for speedy building of a 600-horsepower marine diesel engine. When the order for the unit was placed with the firm, a time limit of 100 days for delivery was set on the job. Drawings were made, patterns finished, and work on machining began as rapidly as possible; with the result that, from ink on paper to the completed machine operating under full power on trial trip, only 90 days had elapsed. It is also of note that though this feat was accomplished some years ago, the engines have ran almost continuously with no trouble whatever, giving most economical service to the owner, the **Kitsap County Tran. Co.** of Seattle, which recently took delivery of a repeat order for a set of 800-horsepower **Washington-Estep** diesels for its ferryboat *Bainbridge*.



High speed cruiser designed by L. H. Coolidge, Seattle. As shown here the boat is making 30 knots. The height of the bow waves is 10 inches above the surface of the water. She is driven by twin converted Liberty motors, driving propellers of 24-inch diameter and 24-inch pitch. Maximum speed 33 knots.

Seattle Workboat Notes

The Ballard Marine Railway Co., Inc., Seattle, of which T. W. Smith is manager, has been exceptionally busy on general repair work for the past several months.

Among the many jobs was the rebuilding of the stern-wheel steamer Ames, now renamed the Skookum Chief. This vessel is 110 feet length by 28 feet beam. Her hull was completely renovated and the steam engines and boilers were replaced by two Washington-Estep diesel engines of 100 horsepower each. The stern was remodelled to tunnel design with twin screw propellers, and the vessel now easily makes 10 knots with a remarkable decrease in operating costs. She will be used as a freighter between Puget Sound ports.

Another rebuilding job at the yard is the steamer Harvester. This vessel will not be re-engined, her old power plant being retained. The hull and machinery are being given a complete and thorough overhaul, and she will be a practically new boat. As her business, hauling trash fuel, insures her a very cheap supply of wood fuel for the furnaces, it was not considered economical to change her to diesel drive.

A quite important job has just been started at the yard, this being the new tug Miki-Miki, for Young Bros., of Honolulu.

Another new job, just completed at the Ballard Yard, is a 28-foot special double-end craft for Siberia. She is powered with a Regal gas engine, and will be used for trading work on rivers of the far North. The Ballard yard has turned out quite a number of these craft, and this work, in addition to a good run of general repairs, has kept things moving.

The Ole Moberg Yard, Ballard, has turned out eight fisher workboats the past year, varying in lengths from 45 to 74 feet. A stock job of 38 feet length by 11 feet beam is on the ways framed, with work going ahead. Power for this craft has not yet been decided on.

The Sagstadt Yard, Ballard, has also turned out six fishing vessels in the past few months. These are of the standard sizes for seining and trolling. Sagstadt also has a stock craft on the ways to fill in the dull season of the fall.



A pile driver barge built on the Ellis Channel System.

The Fishing Vessel Owners' Marine Ways, Inc., at Salmon Bay, have built three of the larger sized fishing boats during the past year.

The Lindy, 76 feet length by 22 feet beam, with a 150-horsepower Atlas-Imperial diesel, is schooner rigged and will be used in the halibut fishery business.

The Norby, a 65-foot fishing and seining boat, is fitted with a 90-horsepower Atlas-Imperial diesel.

The Northern Queen is a dupli-

cate craft to the Norby both in lines and engine.

These three, with a big run of repairs and dock work, have kept the yard busy.

At the Puget Sound Engineering Works, Ballard, Washington, business is reported as very good along general repair lines. A fire damaged cannery tender and fishing boat has been rebuilt. This vessel, owned by Captain Paul Luketa, was formerly powered by a gas engine; this has been replaced by a new Atlas-Imperial 3-cylinder 50-horsepower diesel. The rebuilt craft will be named Antoinette L. and when in commission will be a fine addition to the cannery fleet.

The Lake Union Dry Dock Co., Seattle, has just completed the rebuilding of the steamer Zapora, a halibut fisher of 148 feet length by 24 feet beam. Her steam plant has been replaced by an Atlas-Imperial diesel of 6 cylinders and 350 horsepower. She will be renamed the A. B. Carpenter and operated out of Los Angeles harbor as a refrigerated carrier. All the repairs and changes were made at the Lake Union Dry Dock Co., and the whole job is first class in every way.

In addition to the rebuilding of this vessel, two large power yachts, many small cruisers, and a flock of outboard motorboats have been turned out during the past few months, together with a good run of work on the dry-docks, of which there are five at the yard.



An interesting conversion job. This smart twin-screw freighter was created out of an old steam stern-wheeler by the Ballard Marine Railway Company, Seattle. She has two Washington-Estep diesels of 100 horsepower each.



Trolling boats at Barbare Brothers Shipyard, Tacoma.

A 50-foot tug for the Libby, McNeil & Libby interests was also built, but not engined, this unit being later installed in the north with an engine from another tug operated by the cannery company.

The Blanchard Boat Co., Seattle, specializing on yachts and small boats, has been fairly well occupied on repair and construction jobs. Quite a number of standard cruisers and two yachts in the 80-foot class have been turned out during the past season.

Westlake Engineering Works, Seattle, of which James C. Buchanan is manager, has recently purchased a fine site on Lake Union, at 2144 Westlake Avenue. A new shop and other buildings have been built, and an easy approach by rail and water make the location ideal. The main building is very light and airy, with a wharf to deep water. A heavy outfitting crane is being installed at the end, and the berthing accommodations are ample, a large vessel being easily moored at each side and end with good shelter. Mr. Buchanan has applied his many years of experience to the arrangement of his new plant, and will give all jobs personal supervision. In addition to marine work, the shop is kept occupied in manufacturing standard furnace fittings and other specialties.

The Kitsap County Transportation Co.'s ferryboat Bainbridge, which has been in commission for a few weeks, is doing wonderfully well. This vessel was designed by Captain John L. Anderson, president of the company, and a shipbuilder of parts. The construction was done

by the Lake Washington Shipyards, Houghton; the engine, a Washington-Estep diesel of 800 horsepower, and the largest of the kind yet built in the northwest. A complete illustrated description of this vessel and her power plant appeared in the September issue of *Pacific Marine Review*.

The Bainbridge makes about 12 knots, and has run steadily for some twelve weeks without a hitch of any kind. Her chief engineer and captain speak in the highest terms of praise of her performance, and those who travel by the Bainbridge are more than pleased with her stability, speed, and accommodations. A recent letter from the manager of the ferry company states that the engine with the arrangement of propellers will bring her from full speed to stop in 40 seconds, a most remarkable achievement and of great advantage in handling the vessel.

The Lake Washington Shipyards, Houghton, have had a very good year, general repairs being over the average, with considerable new construction. Among the new jobs was the double-end ferryboat Bainbridge, the Caleb Haley, cannery tender, and the Lindberg, a 42-foot seiner.

A most noteworthy rebuilding job was the widening and practically renewing of the steel passenger steamer Iroquois, formerly of 246 feet length and 39 feet beam. She was widened to 49 feet beam not by spousons, but by reconstruction of the hull, this being renewed from the bottom strakes up. The work cost some \$300,000, and the owners now have a very serviceable combination auto and passenger vessel. She carries 90 autos and a thousand passengers, with staterooms for 160.

The Lake Washington yards also rebuilt the steel freighter W. M. Tupper, replacing all decks and doing considerable other needed work.

The Seattle agency for Atlas-Imperial diesel engines reports the installation, during the past year, of 70 diesel units of from 20 to 350 horsepower and 35 gas engine units.

Richard Froboese Co., Inc., of Seattle, distributor of the Bolinder oil engines, has had a very fair year's business. These engines have been materially improved during the past few years, and their well-known sturdiness and reliability have made them popular among the fishermen and canneries. As an instance of their dependableness, it is noted that on a recent race from



Cruiser Kennett, built by the Vancouver Dry Dock & Salvage Company for E. D. Clarke of Vancouver, British Columbia; a petrol model, 6-cylinder Sterling gas engine drives her at 17 miles an hour.

Olympia, Washington, to Ketchikan, Alaska, one of the contestants, powered with a Bolinder, made a perfect non-stop run of nearly a thousand miles, being the only entrant in her class to establish such a record.

Thomas Skinner, marine surveyor of the Port of Seattle, is as hale and hearty as in days of yore. His business is now helped by his son, also an engineer. Mr. Skinner was well acquainted with the marine men of San Francisco many years ago, and wishes, through *Pacific Marine Review*, to give them all his best regards.

California Notes

Harbor Boat Building Company, San Pedro, California, dealer for the diesel and gas engines manufactured by the **Union Gas Engine Company** of Oakland, is busy on an 80-foot cruising yacht for Joseph F. Logel of Santa Monica.

This yacht, intended for South Pacific cruising, will be finished in selected Siamese teak. She will have twin screws, each driven by a 6-cylinder **Union diesel engine**, and is expected to show a nice turn of speed. Delivery is estimated for January 1, 1929, and the yacht is billed for a South Seas cruise immediately following delivery.

This yard is building also a 64-foot distribution box boat for the U.S. War Department for service in



Combination freight and passenger boat for Yukon River service, designed by Lee and Brinton of Seattle and built by N. J. Blanchard Boatyard, Seattle, for the Northern Commercial Company; 72 feet long, 18 feet beam, 4 feet 6 inches loaded draft aft. Powered with two 3-cylinder, 75-horsepower Washington-Estep diesels, the Ensee makes 8½ knots an hour. She went north under her own power from Seattle to St. Michael.

the Philippines. This boat is to be powered with a 120-horsepower, 6-cylinder, directly reversible **Union diesel**. On completion, this tender will be loaded aboard a U. S. Army transport for delivery at Manila.

Western Enterprise Engine Co. of Los Angeles, manufacturer of the Western-Enterprise diesel engine, is busy on several installations. Among them are a 450-horsepower diesel for a large fishing boat building for Medina at Sausalito; a 450-horsepower diesel for the Matsuki and

Sugizama boat building at San Pedro; and a 300-horsepower diesel for the boat Vaquero of the Vail Company fleet.

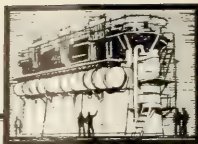
General Engineering & Drydock Company, Alameda, California, delivered, late in August, to A. Paladini, Inc., San Francisco, a fine wooden trawler, the Catherine Paladini. She is 78 feet long, 18 feet 6 inches beam, 6 feet 6 inches depth, with a loaded speed of 10 knots; driven by a 200-horsepower **Atlas-Imperial diesel engine**. She is equipped with 2400 gallons fuel capacity, so that she can stay outside six days in ordinary weather. Accommodations for the crew are comfortable and adequate, and the fish holds are properly arranged to insure the catch arriving in good shape.

The Catherine Paladini has already proved so satisfactory to her owners that they have ordered another vessel along the same lines from the General Engineering & Drydock Company.

The work of the **United Ship Repair Company** of San Francisco in building standard cruisers has increased recently to such an extent that the firm has acquired new and enlarged facilities for the boat building end of its activities. Under the management of **Dan Sutherland**, this firm is specializing in cub and bird class sail boats, with or without power. The new plant will be equipped for efficient production of these classes of boats.



Fishing boat New Admiral on her trials on San Francisco Bay. Built by Anderson & Cristofani of San Francisco for K. Hovden of Monterey, the New Admiral is 72 feet long, 18 feet beam, and 8 feet draft, powered with a 4-cylinder, 135-horsepower, **Atlas-Imperial diesel**.



In the Engine Room

Mechanics For Marine Engineers

Part II: Definitions

By A. L. Becker.

PROGRESSIVE engineers and deck officers (they are the decided majority) are anxious to advance in their profession to the end that they appreciate suggestions offered and readily absorb information which broadens their conception and understanding of their profession. Therefore, it appears that the vessel owner and all others interested in building up and maintaining an efficient United States merchant marine provide that the ordinary principles of mechanics and their application be made available to the personnel of an organization having charge of operating their equipment.

Under the jurisdiction of the United States Department of Commerce, the American Marine Standards Committee is preparing and issuing standards for the details of ship and machinery construction. It requires no further argument to substantiate the great saving in operating and construction costs incident to the completion and adoption of these standards than to cite the scope of American standardized industries in the commercial world.

Judging by the progress so far attained by this efficient department, it is reasonable to assume that the rules and regulations now governing the qualifications of the personnel of the merchant marine will be given attention and revised in keeping with the trend of modern industrial activity; to the end that, instead of the rule for the safety valve and similar problems being committed to memory, the fundamentals of mechanics applying to this and all other similar problems will be given. Also instead of the familiar formula for obtaining the indicated horsepower of an engine, viz:

PLAN

33000

written in this form to facili-

tate memory. The applicant for a license should learn and understand the definition of the elements constituting the mechanics of the problem as in this case Work, Power, and Rate of Work.

Work is the product of a force (in pounds) times the distance (in feet) through which the force acts, expressed in foot pounds of work.

Power is the rate at which work is done, or the work performed in each unit of time (one minute), while the force is traversing the distance. Horsepower is arbitrarily set at 33000 foot pounds of work done per minute. It is evident that if the total work done per minute be divided by 33000, the result is the horsepower of not only a steam engine, but a water fall, a flowing stream, a wind mill, a sailing vessel, an electric motor, a moving train, a towing ship, or any other device or institution incorporating the element of force acting over a distance.

In other words all power of any sort is foot pounds of work or its equivalent accomplished in a unit of time. As in a steam engine,

engineering development applicable to all engineering problems. Rules the force exerted by the piston times the distance in feet the piston travels in one minute (piston speed) is the work done by the engine in one minute. Likewise if a weight of say five tons is lifted from the hold of a ship (30 feet deep) the work in doing this is thirty times five foot tons or 300,000 foot pounds. If this work is done in a given time, say one minute, the result is 300,000 foot pounds of power per minute. If a horse can do 33,000 foot pounds of work per minute we should at least put ten horses on the job and have a margin of 30,000 foot pounds of work in favor of the horses.

By the same reasoning, if it is desired to lift the weight in one half a minute, the Rate of Work would be doubled and two times the power would be required to do the same work in one-half the time.

There is nothing to remember in the above consideration except the definition of the fundamental engineering terms used. The solution is developed through careful analy-

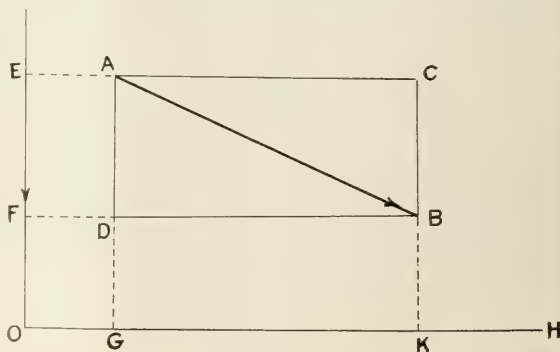


FIG 5

sis based upon the clear understanding of the terms.

Logical thinking is a process in and formulas should be discarded as stunting development when the same are used in lieu of engineering analysis. Often formulas based on experiments are developed in engineering research. An engineering reference book will suffice as a source for this information.

The foregoing indicates the true basis of constructive engineering attainment and the path of maximum benefit derived in the solution of all engineering problems. Rules and formulas, in general, should not be used, unless the user knows the fundamentals from which the rules and formulas are derived. In that event the rule or formula may be forgotten without any loss of engineering knowledge and the energy of memorizing rules and retaining them can be conserved for further analytical thought and study.

Four elementary quantities are considered in mechanics: Matter, Force, Space, and Time.

Matter is defined as any substance or material that can be weighed or measured. It exists in three forms, solid, liquid, and gaseous. A definite portion of matter is called a body. Quantity of matter is usually determined by weighing.

Force is anything that tends to change the state of a body with respect to rest and motion. If a body is at rest anything that tends to put it in motion is a force. If a body is in motion, anything that tends to change its direction or its rate of motion is a force.

Space and **Time** require no definition, as they are used in their generally accepted units.

The subject of mechanics and its relationship to its general subdivisions is conveniently shown by an outline.

Mechanics	{ Solids	{ Statics
		{ Dynamics
	{ Liquids	{ Hydro-statics
		{ Hydro-dynamics
	{ Air, Gases	{ Pneumatics

Mechanics is the science that treats of the action of force upon bodies.

Statics is the mechanics of bodies at rest relatively to the earth's surface, involving the elementary qualities of force and matter.

Dynamics is the mechanics of bodies in motion, involving the ele-

mentary qualities of force, space, and time.

The type of problems illustrated by the safety valve belongs to statics, therefore this subdivision of mechanics will receive first consideration.

Consider a body in space when acted on by several forces that remains stationary in respect to the earth's surface. Such a body is said to be in equilibrium or in balance. This principle of equilibrium is the basis of the solution of all problems in statics. If a condition is presented wherein one or more forces of known value are acting on a body, the process of determining the necessary quantity, location, and direction of a force to produce a condition of equilibrium of the body is the solution of the problem.

There are three conditions which must be satisfied to fully determine the equilibrium of a body acted upon by forces in a given plane.

If two lines be drawn at right angles to each other, as in Fig. 5, designated by O.H. and O.V., as lines of reference for locating forces and their direction, or if we use the terms Horizontal for the line O.H. and Vertical for the line O.V., the three conditions of equilibrium may be stated generally as follows:

(1) The sum of the forces or the components of forces acting in a vertical direction must be zero; that is, if the forces or their components acting downward are called plus, those forces, or their components, acting upward are considered minus; and, therefore, their sum is zero when the plus forces are numerically equal to the minus forces.

(2) The sum of the forces or the components of forces acting in a horizontal direction must be zero. That is, if the forces or their compo-

nents acting towards the right are called plus, those forces or their components acting toward the left are considered minus; and, therefore, their sum is zero when the plus forces are numerically equal to the minus forces.

(3) The sum of the moments of all the forces acting on a body is zero. The moment of a force means, in the language of a marine engineer or deck officer, the turning effect of the force, and is practically represented in such operations as the turning of a nut with a wrench, operating a stop valve, opening or closing the throttle, steering the ship by hand, or operating a capstan by using capstan bars.

The value of the moments is expressed by the product of the force multiplied by the shortest or perpendicular distance of the line of action of the force from the point about which the moment is taken.

The third condition of equilibrium means that, if a body is acted upon by one or more forces and a point is arbitrarily selected in the plane of action of the force, that the sum of the moments of all the forces about this point tending to produce clockwise rotation of the body about the selected point must be equal to the sum of the moments of all the forces tending to produce anti-clockwise rotation about the same point.

If all the clockwise moments are indicated plus, and the anti-clockwise moments minus, and the moments are numerically equal, their sum is zero and the third condition of equilibrium is fulfilled. The three conditions of equilibrium as stated consider the forces as all acting on one and the same plane. It is evident that forces may act at other angles outside of the plane under consideration. The effect of these outside forces may be reduced to the effect in the plane under consideration by the same principles as outlined above.

The three conditions for the equilibrium of a body have been given the reader without any proof or analysis leading up to the establishment of the fact that these are the three and only conditions required to produce equilibrium. The proof is simple from a mathematical analysis.

In the subsequent consideration of typical problems the truth of these conditions and the necessity for all of them will become apparent to the reader.

This series of articles was written by a marine engineer of experience for the purpose of making more practical and useful the studies of operating marine engineers in preparing themselves to take examinations for higher ratings before the Board of Steamboat Inspection Service.

Mr. Becker will welcome all questions and special problems and will publish the solutions in these columns of Pacific Marine Review.

An Old Timer Rewarded

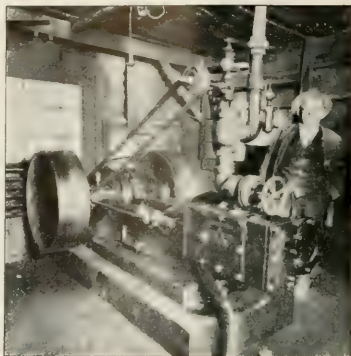
After Forty-Two Years Faithful Service, Steam Veteran is Honorably Retired on Pension

ENGINEERS are generally led to believe that the useful life of a steam engine is somewhere between 20 and 25 years. Many steam units have been retired after much shorter service because superseded by others of more efficient and economical design; but almost all of us have at one time or another seen some steam engine that has lived to a ripe old age and done good work for more than the allotted quarter of a century.

Such is the case with the first engine, built at Auburn, New York, in 1886, by John E. McIntosh and James A. Seymour, of the firm which has since become the McIntosh and Seymour Corporation. This veteran had for many years been lost to the builders, and was discovered through an order for a minor repair part. Investigation showed that it had been through two fires, the latter of which bankrupted the first owner and left his plant a mass of ruins. During the following year, the engine was abandoned and exposed to sun, rain, snow and ice. The second owner accepted it to partly satisfy an unpaid note and, after an overhauling, put it to work in a lumber mill in Moravia, New York.

This engine is rated at 40 horsepower, runs 300 revolutions per minute, and in its second location drove a circular saw from the belt shown on the right flywheel in the illustration.

The mill was dismantled this year, but the old engine at the time was working as nicely as when first put in and, after 41 years of



The first engine built by McIntosh & Seymour.

active daily service, was still entirely satisfactory and considered by the owner as well worthy of further use.

Out of sentiment, this engine has been bought back by the McIntosh & Seymour Corporation, and is to occupy an honored place in the present McIntosh & Seymour plant.

After producing this small unit of the simplest type, the McIntosh & Seymour firm expanded in the steam field, until in 1913 some 1800 steam engines of various stationary types and sizes up to 10,000 horsepower had been built. Most of these units are still in important service today. After having achieved the reputation of producing many of the largest and most successful stationary steam engines in America, the McIntosh & Seymour Corporation in 1914 withdrew completely from the steam field, and has since confined its activities entirely to diesel engines of stationary and marine types.

The Lay of Wire Rope

HAVING oftimes heard disputes among both deck and engine room officers at sea on the meaning of various terms applied to wire rope, we welcomed the recent receipt of an interesting release from an American cable manufacturer in which Oscar Hellgren, wire rope splicer of the

Youngstown Sheet and Tube Company, explains the true meaning of these trade terms and their application in the construction of wire rope.

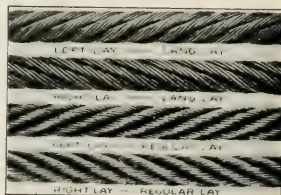
Wire rope, as ordinarily used in the vast majority of service, is stated by Mr. Hellgren to be made up in "any one of 42 different types

of construction, each of which is available in six varying metals." The different constructions are designated by trade name, such as "Seale," "Spacer Seale," "Warrington," or "Tiller." The six metals are "Iron," "Toughened Steel," "Cast Steel," "Mild Plow Steel," "Plow Steel," "Improved Plow Steel."

In any of the 42 construction methods, and with any of the six metals, there are still left for consideration some eight varieties of lays. Thus, for instance, a 1 1/4-inch, 6 by 19, Spacer Seale (which is to say, a 1 1/4-inch diameter rope that is made up of six strands of 19 wires each and in accordance with a construction known as Spacer Seale) might be either Left Lay Lang Lay, Right Lay Lang Lay, Left Lay Regular Lay, or Right Lay Regular Lay—or might be any one of those, plus Tru-Lay.

"Lay" signifies the manner in which the individual wires and strands are laid into the completed rope.

The bulk of commonly used wire rope is of "Regular" lay, in which the wires in the strands are laid in the opposite direction to that in which the strands are laid into the completed rope. This was done to equalize the internal strains set up in wire rope by the old method of forming a complete rope by forcibly



twisting the wires together to make the strands, and then twisting the strands together to make the ropes.

"Lang" lay reverses this idea and lays the strands into the rope in the same direction as the wires are laid in strands. This has three principal advantages, namely, greater wearing surface, greater flexibility, lower bending stresses. It has two disadvantages, liability to the deformation known as "bird caging" when pinched in sheaves or subject to sudden jars; and tendency to kink or be cranky in handling.

"Tru-lay" signifies that both

wires and strands have been preformed before being laid into the strand and rope. Tru-lay, therefore, eliminates all of the internal stresses

due to the twisting process. It improves both Regular lay and Lang lay and removes the disadvantages of the latter.

42" x 60" x 94"

36"

5350 indicated horsepower each engine.

1895. Cruiser Olympia. Twin triples.

42" x 59" x 92"

42"

128 R.P.M.; 8750 indicated horsepower on each engine.

1896. Battleship Oregon. Twin triples.

34½" x 48" x 75"

42"

128 R.P.M. 4500 indicated horsepower each engine.

1900. Cruiser Chitose. Twin 4-cylinder triples.

40" x 60" x 66" x 66"

36"

150 R.P.M.; 155 pounds pressure; 8000 indicated horsepower.

Battleship Ohio. Keel laid in 1899; had 15,100 indicated horsepower on twin screws.

Cruisers California and South Dakota; keels laid 1901; 23,000 indicated horsepower on twin screws.

Cruiser Milwaukee; keel laid 1901; 21,000 indicated horsepower on twin screws.

Marine Engines of Last Century

A Partial List and Some Particulars of the Large Reciprocating Units Prior to 1900

A DISCUSSION among a group of engineers recently revealed the rather astonishing fact that several otherwise well informed steam power plant engineers harbored a belief that there were no steam plants of large power individual units until the turbine showed the way. The turbine became a factor in power plants about 1900, and so the writer, who was a party to the discussion, delved into old records and unearthed data on some of the larger marine power plants existing prior to that date.

Thinking the information might be of interest to operating marine engineers, we present here a few samples.

1853. Engines for screw propeller of Great Eastern; built by Boulton and Watt; 4 cylinders, 84-inch diameter; 48-inch stroke, horizontal, 2 pairs; shaft in center; 2 cranks; 25 pounds steam; 25.5 tons vacuum; 38.8 R.P.M.; 500 tons weight; 4886 indicated horsepower.

1868. U.S. cruisers of Wampanoag class; 2 cylinders; 100-inch diameter; 48-inch stroke; 32.48 pounds steam; 24-inch vacuum; 64 R.P.M.; 17 knots speed; 4048 indicated horsepower.

1889. Paddle engines, river steamer Puritan, New York-Fall River service; compound beam engine; built by Fletcher; high pressure; 75-inch diameter; 108-inch stroke; low pressure, 110-inch diameter; 14-foot stroke; 7500 indicated horsepower.

1894. Fall River Line steamer Priscilla; 4-cylinders, compound; two 51-inch by two 95-inch by 11-foot stroke; 150 pounds pressure; 8500 indicated horsepower.

1895. St. Louis and St. Paul, Atlantic passenger liners built by Cramp; 22,000 indicated horsepower; twin screws; 5-cylinder, quadruple expansion engines; 200 pounds pressure; 11,000 indicated horsepower each engine.

1895. Campania and Lucania, British-built Cunarders; 30,000 in-

dicated horsepower on twin screws; 15,000 indicated horsepower on each engine.

1900. North German Lloyd passenger liner Deutchland; went into service July 1. Total average indicated horsepower on first round voyage 36,500 on twin screw, or 18,250 on each engine.

If any other notable example occurs to any engineer we would be glad to know of it.

We also submit as of special Pacific Coast interest the following details of marine power plants finished or laid down at the Union Iron Works, San Francisco, prior to 1900. Horsepower taken from trial data. The year given is that of delivery of ship.

1890. Cruiser San Francisco. Twin triples.



Old timers around San Francisco Bay will be interested in these four "snaps" taken in August 1896 when the British ship *Blairmore*, afterwards *Star of England*, was raised from the bottom of Mission Bay, San Francisco, where she had sunk during a squall.

Aside from their historical value, these pictures are interesting as showing, first, the details of the deck gear of this fine old ship and, second, the effect of two months' immersion in salt water.

Tacoma's New Fireboat

A TRIM and efficient fireboat, thoroughly modern in design, will soon be on duty in the harbor of Tacoma, Washington, to aid in the protection of the many miles of industrial waterfront of this progressive Northwest city.

The city council last month awarded the contract for the construction of the boat to the Coast Line Shipbuilding Company of Tacoma on a bid of \$140,285. A. A. Crowcroft is the head of the concern. It is expected that the boat will be launched in about nine months.

The details of this craft show something of the modern trend of boats of this type.

She will be 95 feet 6 inches long over-all with a beam of 21 feet 6 inches, but will draw only six feet of water as a maximum, enabling her to work close in to shore.

The hull will be of mild steel, with a single bottom, slightly curved stem and cruiser stern. A continuous deck fore and aft, with a steel deckhouse and truck and fire-fighting tower are specified in the contract.

The vessel is to be propelled by triple screws driven by gasoline en-

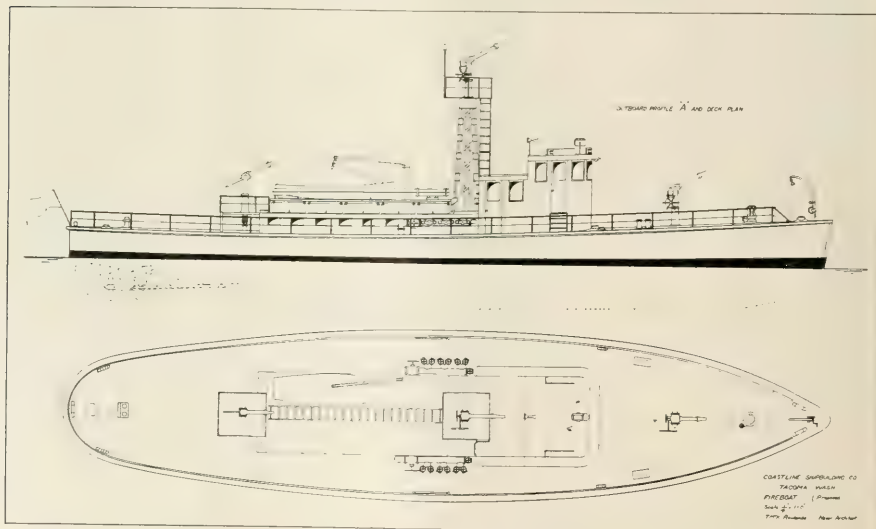
gines, with additional gas engines for the pumps. The engine room will be one of the show places of the craft, with three 6-cylinder Sterling-Viking II 8- by 9-inch marine engines, 425 brake horsepower, turning 1200 revolutions per minute for the motive power; two 6-cyl. Sterling-Viking II 8- by 9-inch commercial engines, 425 brake horsepower, turning 1200 revolutions per minute, will each be directly connected to a De Laval centrifugal pump of 2500 gallons per minute capacity; a portable 8 by 6 wrecking pump on a 20 horsepower gas engine; a 2-horsepower E.B. Lacer air compressor; two Kohler engine generators, one of 10 kilowatts and one of 5 kilowatts, both set at 110 volts; and the mechanism of a Cunningham electric and hand steering apparatus.

The specifications require that the boat will run 16 miles per hour and she is to be tested four times over a measured mile course before acceptance. There will be four gasoline tanks, two of 1000 gallons capacity each, two of 1500 gallons 6500-gallons-per-minute monitor or turret nozzle of the A. J. Morse type is mounted on the forward deck. A 2000-gallons-per-minute monitor will

be mounted on an extension tower which is just aft of the pilot house; and a third monitor of 2000-gallons-per-minute capacity will be mounted on the after deck. There will be two hose manifolds with connections for seven lines of hose. Other equipment includes extension and rope ladders, axes, and extinguishers.

The center line engine is solidly connected to its propeller shaft; but the two wing engines are connected to their screw shafts by Kinney clutches, and at their forward ends are each connected by clutch to a De Laval pump of 2500 gallons per minute capacity. It will be evident, then, that this boat has 2125 brake horsepower in five engines, and that four of these engines are available for pumping power, the four pumps having a combined capacity for 10,000 gallons of water per minute.

The new boat is made possible by a bond issue of \$175,000 approved by the voters several months ago. The remaining funds will be used to provide docking and housing facilities for boat and crew at some advantageous place on the Tacoma waterfront.



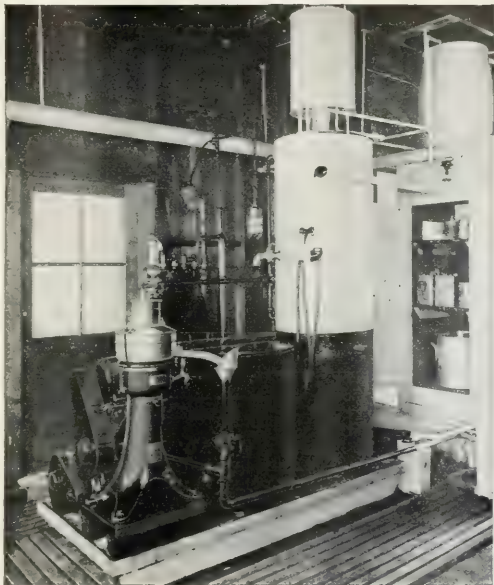
Outboard profile and deck plan of the new fireboat being built by the Coast Line Shipbuilding Company of Tacoma, Washington.

Reclamation of Lubricating Oil by the United States Coast Guard

ORGANIZED under an Act of Congress, approved by President Washington on August 4, 1790, the United States Revenue Cutter Service, now known as the United States Coast Guard, has been actively engaged in sea service peace times as well as war times ever since. The passage of the Eighteenth Amendment to the Constitution increased their activity tremendously, and led to an interesting practical operating economy as described in the following extracts taken from a very interesting article by Lieutenant-Commander Norman B. Hall in a recent issue of the *De Laval Centrifugal Review*:

"On the Atlantic Coast between Boston and Norfolk, where the effort at smuggling is greatest, the Coast Guard today operates no less than 160 patrol and picket boats. The patrol boats are 75 feet long, 14 feet beam, 4 feet draft, and carry a crew of eight men. They are driven at a speed of about 16 miles an hour by two 200 horsepower Sterling gasoline engines. The picket boats, which are of the high-speed run-about type, are 36 feet long, carry three men, and are driven at a speed of about 24 miles an hour by one 180 horsepower Speedway gasoline engine. These boats are engaged solely in the prevention of smuggling, and operate in conjunction with the Coast Guard's larger vessels, which have many other duties to perform, out of the following bases: Boston, Gloucester, Woods Hole, Nantucket, Block Island, New London, New York, Atlantic City, Cape May, and Norfolk. The boats attached to the bases mentioned form but a relatively small part of the total fleet in service, the Coast Guard having become in recent years one of the largest users of gasoline engine-driven units in the world either on land or sea. In all something like 1000 engines of the types mentioned are in service. The addition of these units to the Coast Guard fleet has, of course, tremendously increased the expense of the Department.

It had been, and still is, the practice to drain crankcases once a week while the boats are cruising, and since the engines carry from six to eight gallons of oil each, lubricating costs for the fleet were



De Laval crank case oil reclaiming outfit installed at Cape May, New Jersey, for the United States Coast Guard.

high, there having been about 1000 gallons of oil thrown away weekly."

An engine salvaging plant having been established in an old United States Navy airplane base at Cape May, New Jersey, it was determined to save this waste, and a De Laval crank case oil reclaiming outfit was installed. With this outfit, water, carbon, and any solid impurities are removed from the oil by washing, chemical treatment, and centrifuging; and the gasoline dilution is removed by evaporation. Since the patrol boats idle a great deal while on watch at sea, there is always considerable dilution of the crank case oil by gasoline. In fact, the recovery of gasoline by the fume condenser attached to the outfit is 15 per cent of the entire volume of oil handled. This gasoline is mixed with the oil fuel used by the diesel engines on the larger cutters. Out of approximately 1000 gallons of oil drained from crank

cases each week, 700 gallons go back to work as lubricating oil and 150 gallons go to fuel. It is planned eventually to use this gasoline in the gasoline engines of the patrol boats.

This outfit is run 24 hours a day on alternate months. The cost of recovery is about 10 cents a gallon for both oil and gasoline.

The equipment at the reclamation plant includes an oil testing laboratory, which is sufficiently complete to enable the operators to obtain a reading covering all the characteristics of the oil in which they are interested, and it has been shown that the reclaimed oil is equal, if not slightly superior, to new oil.

"Thus far there has not been a single complaint from any of the bases regarding the oil sent them, and this is considered somewhat unusual in view of the aversion product that has been reclaimed."

Hamburg-American Motorship Portland

A RECENT visitor to San Francisco on her first regular voyage from Hamburg was the motorship *Portland*, fourth of the quartet of modern freight and passenger motor liners that will regularly operate in the new Hamburg-American Line service between ports of Western Europe and ports of the Pacific Coast of North America.

The *Portland* was built at the Vulcan Works, Bremen, and is a little larger than the other ships on this run. She is 468 feet long, 60 feet beam, 29 feet 4 inches molded depth, 25 feet 6 inches loaded draft, with a deadweight cargo capacity of 9350 tons.

This vessel was particularly interesting to the marine engineers of the Pacific Coast, because her engine was of greater horsepower on a single screw than any that had yet visited San Francisco Bay. *Pacific Marine Review* was very glad, therefore, through the courtesy of the local Hamburg-American officials, to be able to get the very good photographs of this engine room from



The dynamo flat on the motorship *Portland*.

which the illustrations published with this article were made.

The engine of the *Portland* is of the new M.A.N. double-acting, 2-cycle, slow speed, marine type. M.A.N., after long experiments, standardized, about three years back, on 700 millimeter cylinder bore and 1200 millimeter stroke for

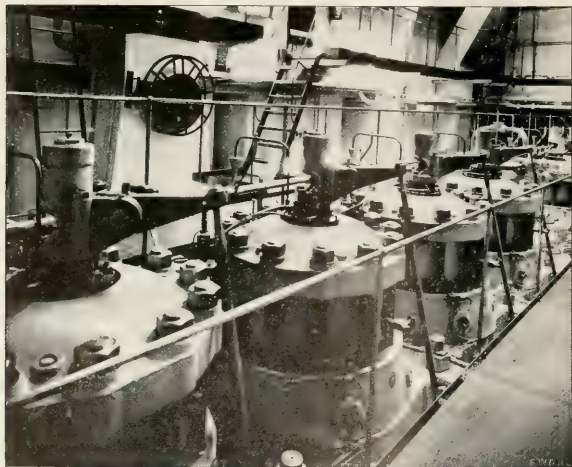
this type of engine. The engine on the *Portland* has 7 cylinders and, at 84 revolutions per minute, develops 5400 brake horsepower and drives the vessel at 14 knots speed.

Fuel in these engines is delivered by the solid injection method. In the upper cylinder cover, as will be noted in the illustration, the fuel valve is centrally located and there is one horizontal safety valve installed in each cover. In the lower cylinder cover are arranged two fuel valves, the starting valve and a safety valve, all horizontal. The two fuel valves in the lower cover are grouped around the piston rod in such fashion as to spray outward towards the cylinder wall. Both upper and lower cylinder covers are in two parts. The actual cover is of electric cast steel and is separated from the cylinder frame by a cast iron pressure member which carries all of the horizontal valves. The division line between this cast iron member and the cylinder liner is at the point reached by the upper or lower piston ring at the end of travel.

The maneuvering gear is very simple and conveniently arranged. Reversal, starting and speed control are all effected through a single hand wheel. By a simple, interlocking system with the engine room telegraph, this control may be so arranged that it is impossible for the engineer in charge to make a false maneuver.

The division line between the upper and lower cylinder liner is arranged below the ports so that all ports are in the upper portion of the liner. This enables the lower portion to be of such short length that it can be taken out, together with the lower cylinder cover, through the columns above the crank case. It is claimed that this new design of M.A.N. double-acting 2-cycle diesel is of less weight per horsepower than any standard marine diesel of the same speed.

The *Portland*, like her sister motorships *San Francisco*, *Los Angeles*, and *Seattle*, is equipped to take care of 25 first class and 25 third class passengers. She made the long voyage out from Hamburg without incident, so far as engines are concerned, and is operating to the satisfaction of her owners and builders.



Upper platform in the engine room of the motorship *Portland*, showing top cylinder heads and valve gear of the 7-cylinder, double-acting M.A.N. engine.

Nelsec-General Electric Diesel-Electric Towboat

FOLLOWING closely on delivery of its initial order, the Tennessee Coal, Iron and Railroad Co. of Birmingham, Alabama, has within the past month contracted for two duplicate Nelsec engines, each of 550 shaft horsepower for use in its second diesel-electric towboat now being built. The hull work is being carried out by the American Bridge Company at its Ambridge, Pennsylvania, plant, and the installation and completion work will be done by the Carnegie Steel Co. of Pittsburgh.

This towboat, which is a duplicate of the first, will have the following general dimensions:

Length 140' 0"
Breadth 25' 0"
Depth 9' 3"

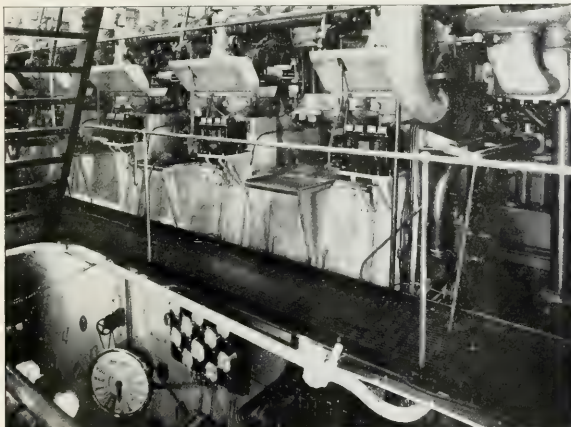
The diesel-electric installation will consist of two 550-brake horsepower Nelsec diesel engines built by the New London Ship & Engine Co. of Groton, Connecticut, and will be direct-connected to two 335-kilowatt, 250-volt, General Electric Co. direct-current generators operating at a speed of 250 revolutions per minute. The boat being of the twin screw tunnel stern type, each propeller will be driven by a 400-horsepower double armature motor turning at 140 revolutions per minute.

The power for auxiliaries, lighting, and excitation purposes will be furnished by two 40-kilowatt ex-

citers driven off the main engines. The Ward-Leonard system of variable voltage control will be used, and operating controls will be used both in the pilot house and in the engine room. These modern towboats will operate between Birmingham, Alabama, which is approximately fifteen miles from Birmingham, and Mobile. Due to the number of locks and the many sharp bends in the Warrior River, it was decided that a diesel-electric craft

would offer the greatest efficiency and flexibility for handling the heavy tows under the above conditions.

The economy of diesel propelled boats is self-evident even in the face of low coal prices, when one considers the speed of towing, continuous power output, the great reduction in the quantity of fuel necessary, and the inherent economy of the diesel internal combustion engine.



Two views in the engine room of the Hamburg American Line motorship Portland, whose description appears on the facing page. The upper view shows the cam shaft and oil pumps on the middle grating and, underneath the grating, part of the control station of the 7-cylinder, double-acting M.A.N. diesel.



The lower view is on the lower platform of the engine room, featuring the crank case covers, piping, and auxiliary pumps.

Airplane Carriers Lexington and Saratoga

Some Interesting Facts and Figures About the Power Plant and Auxiliaries of the World's Fastest Ships

THE U. S. S. Lexington, built at the Fore River yards of the Bethlehem Shipbuilding Corporation, Quincy, Massachusetts, in her recent speed trials on the Pacific Coast, established five world records in a run from San Pedro to Honolulu. On the first day out the carrier made 700 miles, breaking the previous mark for distance steamed in 24 hours. On the second day of the Lexington's voyage she exceeded her performance of the first day by making 742 nautical miles. The remaining distance to Honolulu, 786 miles, was covered in 24 hours, 34 minutes. Thus the ship on three successive days broke the 24-hour steaming record three times, established a new record for miles steamed in three successive days, and set a new mark for the trip from the United States to the Hawaiian Islands of 72 hours, 34 minutes for the 2228 nautical miles. The best previous record was 75 hours and 40 minutes, made by the light cruiser U.S.S. Omaha in 1923. The world's 24-hour record for merchant ships of 675 miles, held by the Mauretania, is about 100 miles less than the Lexington's third day run.

The Saratoga, built in the Camden Plant of the American Brown-Boveri Electric Corp., is identical with the Lexington in every respect and in a recent test in Pacific waters attained a speed of 33.42 nautical miles an hour over a measured mile course, another world record. On her voyage from the Camden shipyards to the Pacific this car-

rier demonstrated the possibility of being used as a base for dirigibles. The dirigible Los Angeles effected a landing on the airplane carrier's vast deck while the Saratoga was moving at a speed of 15 knots. The Los Angeles is 680 feet long. This feat demonstrated the feasibility of refueling dirigibles and aircraft at sea. With such, or similar, available landing places at sea the radius of operation of all aircraft will be greatly increased.

The Lexington and Saratoga today present a radical departure from accepted standards in the building of battleships and cruisers. Instead of the symmetry that is usual in putting the smokestacks in the center of the vessel, with gun turrets ranged around, they have been placed to one side, with gun turrets containing the most modern anti-aircraft weapons, in a straight line, forward and aft.

The runway for airplanes extends to the very extremities of the ship. Not even the minutest obstruction is in a position that might handicap the movement of planes, which are raised and lowered by elevators from hangars below.

The armament of the ship is aimed primarily at air attack, which would be the expected avenue in an attempt to keep the planes from taking their part in the engagement. There are five 5-inch anti-aircraft guns and eight 8-inch guns now on board the ship.

The electric machinery on each carrier, designed and built by the General Electric Company, is the

most powerful ever installed on board a vessel. On each ship there are four 35,000-kilowatt turbine generator sets, supplying electricity to drive eight 22,500-horsepower motors, connected in pairs to the four propeller shafts. This tremendous force, equivalent to 180,000 horsepower, is greater than the combined rated output of the six electrically driven battleships now in commission, viz., the New Mexico, California, Tennessee, Maryland, Colorado, and West Virginia. This amount of electric power would be sufficient to supply the needs of a city of 700,000 population.

The steam necessary to develop the power required is furnished by 16 water-tube, Yarrow type, oil-burning boilers. Each boiler is installed in its own water-tight compartment, and the air required for the burning of the fuel oil is supplied by steam-driven force-draft blowers, two to each fire room. The total heating surface of all the boilers equals about $4\frac{1}{2}$ acres.

The Lexington will exemplify the last word in radio equipment. Although to all appearance she has decks that are almost unobstructed by masts and aerials, nevertheless she is completely fitted out for sending and receiving radio messages.

The aerial is run to the deck from a single topmast, which must be lowered when the vessel passes under such obstructions as the Brooklyn Bridge.

The capacity of the fresh and salt water pumps aboard amounts to



Broadside view of the Lexington on her preliminary trials.

21,363,600 gallons an hour. These pumps are used for salt water, circulating, boiler feed, fresh water, fire main, sanitary systems, and other services. Basing a comparison of the pumping arrangements on that which supplies Boston and suburbs with water and has an average hourly consumption of 5,000,000 gallons, the pumps of the Lexington would readily serve the needs of a population of 4,000,000 people.

Oil pumps are numerous aboard, those being used for boiler fuel and general machinery purposes having a pumping capacity of 208,200 gallons an hour. The total capacity of oil and water pumps aggregates 359,506 gallons each minute.

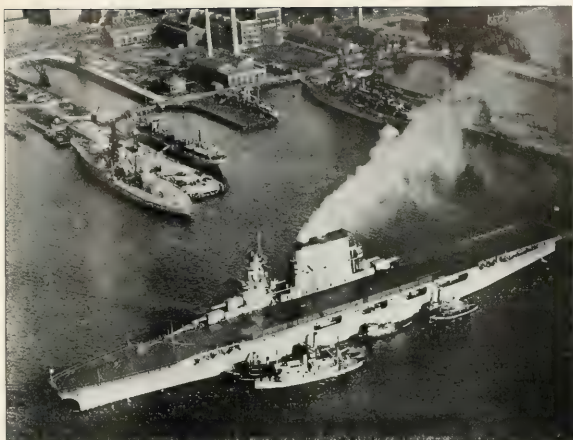
The rudder of the Lexington is of special interest, being of the balanced, stream-line type, weighing 115 tons, in itself a miniature ship. The rudder is controlled by hydro-electric machinery containing eight hydraulic rams.

A feature of the ship is the stowage of life boats and auxiliary craft in recesses in the side in order that the top deck may be wholly used for the aircraft. For the same reason the smokestack, tripod mast, conning tower, and gun turrets are on the starboard side rather than on the center line.

The interior communicating systems include the telephone and order transmitting, which require the use of wiring to the length of 52 miles. Ship service is provided for by 325 telephones, as well as a general loud speaker announcing telephone system consisting of 236 telephones. A call bell system comprising 500 annunciator drops, 710 push buttons, and 248 bells is in operation. A feature of these interior systems is the provision made for sounding alarms, the fire alarm arrangements consisting of 230 stations, and a general alarm gong system of 216 gongs and howlers.

The last word in electrical equipment is to be found in the galley of the Lexington, as well as in the motor rooms. The food is cooked on 15 electric ranges and in 7 electric ovens. Labor-saving machines used in meat grinding, dish washing, and potato peeling are fitted, along with many other miscellaneous items all intended to relieve drudgery and promote happiness.

The complement of the Lexington numbers 1904 men. To comfortably house them was no small problem, yet has been accomplished



An excellent airplane view of the Saratoga showing the peculiar offset superstructure giving completely free airplane passage for the whole length of the ship.

wonderfully well. The living quarters of the men are all above the water line, thus providing as much natural light and ventilation as possible. The ship, however, it fitted throughout with mechanical ventilation, the intake and exhaust flow being regulated to the needs of each compartment. All

staterooms are fitted with steel furniture, and there is a comfortable reading and reception room provided for the members of the crew.

As an English authority has said, "These ships represent the climax of American practice in applying electric power to warship construction."

Honors for Electric Drive

Efficiency Pennant of United States Navy Goes Again to the U.S.S. New Mexico

THE U. S. S. New Mexico, the first electrically-propelled battleship in the world, has been awarded the highest prizes of the United States Navy for excellence in performance for the year 1927-1928, according to word received by the General Electric Company, builders of the electric equipment. She has been awarded the honor trophies in battle efficiency, gunnery, engineering, and communications, a record never before attained by any battleship.

This is the second time the New Mexico has won the battle efficiency pennant, a record which has been duplicated by only two other ships, the Michigan and the California.

The New Mexico, in winning the engineering trophy this year, also establishes another record. She is the first to have won this coveted

prize three times, having received this award for the years 1919-1920 and 1920-1921.

In addition to the electrical equipment on the New Mexico, the General Electric Company has furnished the electric drive on five more of Uncle Sam's capital vessels—the California, West Virginia, Maryland, Lexington, and Saratoga, the latter two being the new airplane carriers added to the Navy this year.

The General Electric Company has furnished, also, complete turbo-electric propulsion plants for many commercial craft. Notable among these is the intercoastal passenger liners for the Panama Pacific Line. The California, first of these liners, has been in operation with increasingly satisfactory results for nearly a year. The Virginia will go into commission about January 1.



Auxiliaries•Ship Supplies•Marine Equipment

Cramp-Morris Industrials, Incorporated

Famous Cramp Shipyard Merges into New Industrial Combination

IN RETIRING from the business of building ships, the William Cramp & Son Ship & Engine Building Company of Philadelphia created a new corporation known as the Cramp-Morris Industrials, Inc. This corporation coordinates the work of six subsidiaries.

The first of these is the I. P. Morris Corporation of Philadelphia, designer and constructor of hydraulic turbine machinery and pioneer in its line in the United States. This subsidiary celebrates, in 1928, its one hundredth anniversary, and has supplied equipment to most of the large hydro-electric developments in the eastern part of the United States and Canada.

Second, the De La Vergne Company of New York, which has occupied for about forty years three city blocks at 138th Street and East River in that city. This company is one of the oldest American manufacturers of refrigerating machinery, and in its later years has also been putting out a very fine line of diesel engines.

Third, the Federal Steel Company of Chester, which for a number of years has been doing a large business in heavy steel castings for both marine and industrial work.

Fourth, the Cramp Brass and Iron Foundries Company, which was formed from a department of the William Cramp & Sons Ship & Engine Building Company.

Fifth, the Cramp Engine Manufacturing Company, formed to take over the marine machine shops of William Cramp & Sons Ship & Engine Building Company.

Sixth, the Pelton Water Wheel Company of San Francisco, an internationally known producer of hydraulic turbine machinery and pioneer in the application of reaction turbines to high head waterfalls.

All of these subsidiaries during the past two years have had a fair run of business.

The volume of the foundry work has been greater than at any time since the close of the European war. The gross annual sales have approximated eight million dollars.

The management of Cramp-Morris Industrials, Inc., is in the capable hands of H. Birchard Taylor, who has been carefully studying and analyzing the working of these subsidiaries in connection with liquidation of the William Cramp & Sons Ship & Engine Building Company, of which concern he is also the president. After much study it was decided this past summer to sell the real estate holdings of the De La Vergne Company in New York and move the machinery and inventory of that company, having a total value of \$2,000,000, to the Cramp Machine Shop in Philadelphia. A purchaser was found for the real estate in R. Hoe & Com-

pany, manufacturers of printing presses. On July 31 the sale was completed and Cramp-Morris Industrials, Inc., began to move the tools and materials to Philadelphia.

This moving has been very carefully planned so that production of the De La Vergne outfit can go on unimpaired, the combined facilities of the two machine shops being used so that as production falls off in New York it is caught up in Philadelphia. The move will be completed by November 1, and it is estimated that the economies effected in the cost of manufacturing by this change will offset the cost of moving within two years.

De La Vergne diesel engines are largely in use in oil pipe line operation, industrial plants, as standby power with public utility corporations, and in marine propulsion.

Todd Plant at New Orleans

THE Board of Commissioners of the Port of New Orleans has completed the 1500-foot wharf, constructed for the Todd Engineering, Dry Dock and Repair Company on the right bank of the river. At the same time the company has finished its shop, office building, boiler house, and other accessory construction. The 12,000-ton electrically equipped floating dry-dock, which is now part of this plant, increases greatly the ship repair facilities already existing in New Orleans Harbor. The Todd company's total outlay on wharf, buildings, and equipment is more than \$1,000,000.

The wharf, built by the Board from funds advanced by the Todd company, according to the usual contract terms, is 1500 feet long and 32 feet wide, with tracks extending its full length from the United States Navy Yard to the Immigration Station Wharf. These tracks accommodate a 15-ton trav-

eling crane, used for efficient and speedy handling of heavy material from ships to the shops. The tracks are of standard gauge and can be connected to trunk lines in case of emergency. The wharf is connected throughout with air lines, 6-inch fire lines, and steam lines. Alongside is a minimum depth of 50 feet at low water, which is approximately the depth needed for docking large steamships. The wharf is of heavy pile and timber construction, some of the piles being over 100 feet in length.

A pier of similar construction, with rails for the traveling crane, extends from the wharf over levee and roadway to a 10-ton stationary crane which is used for loading and unloading cars for the shop. The shop, in rear of the levee, is of heavy steel construction, 88 by 200 feet in dimensions, equipped with a 20-ton electric traveling crane, 30-foot plate rolls, mangle rolls, plate punches, shears, 42-foot lathe, bor-

ing mills, drill presses, shapers, pipe machines, bolt machines, 30-foot plate furnace, bending slabs, steam hammers, air compressors, and complete pipe and blacksmith shops.

This new plant is an extension of the present facilities of the company, which now occupy two city blocks in the City of New Orleans at South Peters and Howard Avenue.

New Flood Light Attachment

THE Prest-O-Lite Co., Inc., 30 E. 42nd St., New York City, announces a flood light attachment of new design for use with the familiar small tanks of dissolved acetylene, the same as are used for truck and tractor lighting.

Prest-O-Lite gas tanks are available from service stations throughout the country. By the connection of the attachment a convenient, portable, powerful flood lighting unit is obtained which can be used for illumination in dark places and for facilitating night work of all kinds.

The improved attachment, illustrated herewith, is of simple, strong, rigid, and compact construction. Universal adjustment is obtained with only one swing joint, this minimizing the possibility of leakage.

Because of the substantial construction of the new part and because of its position near the center line of the tank, the attachment itself can be used as a handle in carrying the entire unit.

The reflector, which is 10 inches in diameter, can be taken off by removing a single knurled nut. A new type of burner is used which will



Prest-O-Lite tank with the new floodlight attached.

not "carbon up." This burner is placed at a fixed focal point and requires no adjustment.

stroke. It always acts to prevent the piston from striking the handle end as this air cushion is not dependent upon an air-tight joint between the handle and the barrel.

The barrel of the hammer is made of special steel heat treated and ground to exact dimensions. An open type outside trigger handle is furnished as standard but closed or inverted type handles can also be supplied.

Vacuum Distilled Cylinder Oil

CARBON has become increasingly menacing to every motorboat operator since the high-speed, high-compression motor is here to stay. Clearance between pistons and cylinder heads in these motors is greatly reduced, sometimes being only 1/32 inch! Thus even a slight deposit of hard, flinty carbon will cause preignition "knocking" that lowers efficiency and shortens the life of your motor.

Now connect that fact with this other fact. Oil forms carbon because the oil breaks down under heat. Ordinary motor oil refined by methods requiring high heat, can stand only a comparatively small amount of heat in the motor because it has already partly broken down in the refining process.

A new way to refine oil without high heat, thus producing a motor oil with its wonderful natural properties unimpaired, was discovered by Dr. Edeleanu of Rumania, considered the world's foremost oil technologist. This is the vacuum still method, whereby motor oil is made from crude oil at low temperature and low pressure. Dr. Edeleanu's great discovery was promptly adopted by the Shell Company, and Dr. Edeleanu came from Rumania to supervise personally the installation of his method for the production of Shell motor oil.

An Improved Riveting Hammer

A NEW line of riveting hammers 5, 6, 8 and 9 inches, has been in four sizes, having strokes of developed by the Ingersoll-Rand Company, 11 Broadway, New York City.

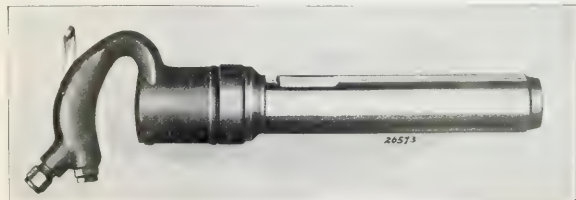
The new hammers are said to be high in power, easy to operate, and low in air consumption. They have several improved features of construction which insure reliable and economical service.

An important feature is the manner in which the handle is fastened to the barrel and kept tightly in place by a spring locking device. The handle is threaded on to the barrel, and the spring lock not only prevents the handle from unscrewing but applies tension to automatically tighten it.

The valve operates in a hardened and ground valve box located at the

head of the barrel and clamped in place by the handle. The valve is exceptionally strong and durable, having large bearing surfaces and being free from any holes or ports from which cracks could start.

The valve box, which houses the valve, has a solid upper end which provides a positive compression chamber for the piston on its up



Latest addition to Ingersoll-Rand line of pneumatic tools.

Motorized Auxiliaries For Motorships

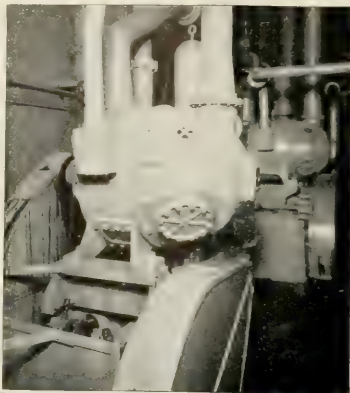
By A. O. Loomis, Marine Engineering Department,
Westinghouse Electric & Manufacturing Company, East Pittsburgh.

THE use of electric auxiliaries on diesel driven vessels is almost universal. In this connection one finds the present day records of new and converted motorships filled with references to auxiliary applications successfully electrified. This formidable alliance of the diesel and the electric motor is noteworthy, not only because of the high efficiency of the units, but also on account of the economical and extremely convenient method of transmitting electric energy from the diesel-electric generator to the electric motor.

Even aside from the economic considerations, there are also additional advantages of electric driven auxiliaries over those driven by steam. These advantages assure repeat orders for electric equipment even on steamships.

Generating Plant

The determination of capacities and the number of generating sets is a consideration dependent upon the normal and maximum loads at sea and in port. Usually the loads at sea are fairly steady, these be-



Westinghouse motors, fitted with forced ventilation, for operation in atmosphere of explosive gases. Installation is on motor tanker *Gulpride*.

ing made up of lighting, engine room auxiliaries, steering gear, heating appliances, and the like. The port load for cargo-carrying vessels, excepting those having liquid cargoes, is generally fluctuating, being composed of the winch load, lighting, and small power loads. The size of the plant is often

based on the port demand, this being greater usually than that at sea, because of the comparative size of the winch load and on account of its fluctuations. For obvious reasons, a spare set which can be substituted for any other connected to the auxiliary power bus should be installed as a part of the regular plant equipment.

The extensive use of electricity on diesel passenger ships requires large auxiliary power plants; in fact, some of them are larger than those on modern battleships.

The electric lamp, which was the original reason for the use of auxiliary generators, requires usually only a small percentage of the total generated power. In order to simplify some installations, a few lighting systems on shipboard are fed from the 230-volt supply. However, the majority of the larger vessels have three-wire generators or balancer sets to supply the neutral connection for the 115-volt lighting circuits. On small craft low voltage power and lighting are supplied directly from the auxiliary generator.

Under Deck Auxiliaries

The auxiliary power load on the average motorship includes all the equipment except such as is driven by steam or compressed air for "stand-by" purposes. Pumps of the centrifugal and rotary types are numerous and are conveniently coupled to electric motors, also having rotary motion. In fact, with the advent of the positive suction centrifugal pump, the electric motor assumes on shipboard an even more important role than formerly, when more reciprocating auxiliary machinery was electrified.

Over the ordinary range of ratings for engine room auxiliary machinery, forced ventilation of the motors is not required. Where the sizes are such that, for continuous ratings, forced ventilation of enclosed motors would be required, usually these cases can be handled (except in vicinity of explosive gases) by the use of drip-proof, self-ventilated equipment.

The particular location of a motor on shipboard may make necessary the use of a totally enclosed motor, as for instance near the bilges where splashing water would



Motor driving the engine turning gear on motor tanker *Mary Ellen O'Neil*.

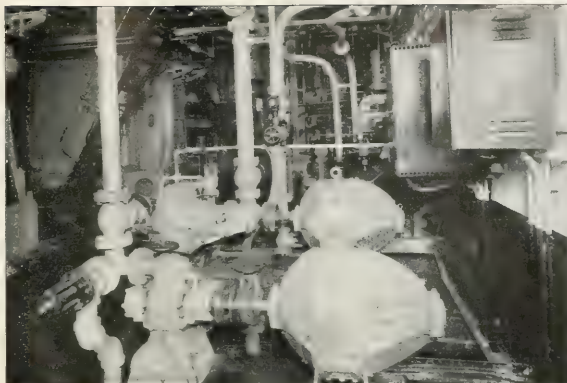
soon destroy non-waterproof equipment. However, some of these cases can be electrified by the use of the vertical type of motor having a coupled connection to the pump below the motor. Such applications often result in locating the motor in clean surroundings on the deck above that on which the pump is situated.

The intermittently rated motor when placed below the exposed deck, although not as rugged as the motor for above deck service, has sufficient heat-storage capacity to permit of the addition of totally enclosing covers without much reduction in the horsepower rating of the equivalent open motor. The main engine or shaft turning motor is an example of intermittently rated under-deck equipment where the addition of totally enclosing covers is advantageous from the application standpoint and feasible from a consideration of the electric design.

Where sleeve bearings are used for extreme reliability and for heavy duty geared service, the importance of using a bearing housing which will not leak oil is apparent. The stopping of oil leaks from the bearings of electric machinery has seemed to Westinghouse of such importance that a "sealed sleeve" bearing has been developed which will operate without leakage and for a long period without attention or replacing the oil.

Controllers for under deck applications are of the manual or magnetic types. For example, the engine turning equipment will function very well when controlled by a cam or drum controller having separately mounted protective panel and resistors. The protective casing for the cam or drum switches is effective in keeping out splashing water or oil and in addition protects the interior against accidental injury. Likewise the protective panel should be mounted in a drip-proof cabinet. Although the resistors need not be so protected, the shipbuilder usually installs protecting screens for the purpose of preventing accidental contact with the grids. Except for certain important pieces of equipment, such as limit switches, used in connection with steering gears, water-tight control equipment is not usually necessary for under-deck service.

Without question, the most popular form of under-deck control equipment is the magnetic type with push button stations for the convenience of the operators. This form of control is installed in two



Motor driven pump installation, engine room of the motor tanker Gulfpride.

ways, namely, individual units and switchboard groups.

The individual unit plan is to mount the panel near the motor which it controls. For this type of controller the drip-proof cabinet is essential to protect the panel against mechanical injury and falling liquids.

Because of the centralized grouping of machinery in the engine room and the possibility of locating one or two centralized group control units adjacent to the power and lighting switchboard, or any other suitable position of advantage to the operators, the desirability of preparing engine room layouts with the auxiliary controllers grouped in the switchboard type of units is quite obvious.

Control panels designed for group mounting are economical of space, since the question of cabinet enclosure is not involved as in the case where individual controllers are set up throughout the engine room. The desirability of having many controllers grouped where repairs can be made in clean and dry surroundings is apparent.

The advantages obtained by the use of magnetic starters are enhanced when the equipments are grouped in one location where the engineer in charge can supervise in the best possible manner the operation of the auxiliaries. Also the ease of inspection of this entire control unit should appeal to the electrician.

Ventilating systems on shipboard are grouped to great advantage under the plan of centralized control. The location of the control station near the electrician's or junior en-

gineer's quarters is convenient. Unlike the engine room equipment, the operation of the ventilating fans cannot be observed from the control station. Lamps to indicate which systems are running are mounted on the control panels. The practice of providing centralized control for hull ventilation is more popular on foreign vessels than on ours.

Under the two arrangements for controllers, as already described, the starting and speed regulation (by shunt field adjustment) of all types of under-deck machinery is possible and extremely convenient. The push button station makes it possible for the attendant to start or stop the motor and, if a rheostat is supplied, adjust the speed of the equipment either at the motor or starting panel, depending upon the location of the rheostat. Usually overload and low voltage protection is needed on shipboard. Such protection means that the motor will stop if sufficiently overloaded or upon substantial reduction or loss of the line voltage.

There is a further advantage in the use of the magnetic type of controllers over those manually operated, namely, the possibility of applying such equipment to the automatic starting and stopping of certain pumps and compressors. When diaphragm and float switches, also pressure gauges with relays, are substituted for the pushbuttons, the liquid levels or pressures are maintained. All this can be accomplished without the aid of the men on watch except, of course, their attention to a regular maintenance schedule.

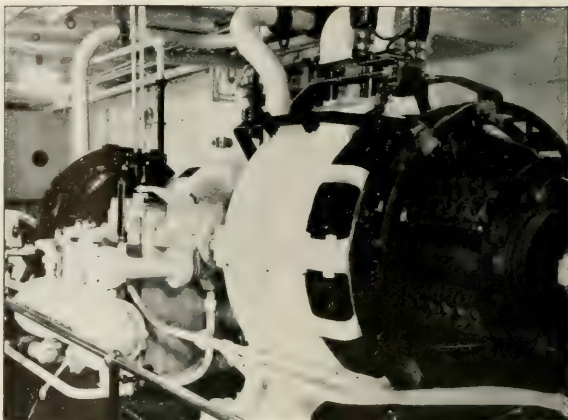
New Turbo-Generator on Maui

A 200-KILOWATT auxiliary turbine-generator set of the most modern design was recently installed aboard the steamship Maui. The unit was built and installed by the Westinghouse Electric and Manufacturing Company to care for the additional load required by the four new Westinghouse heavy duty galley type electric ranges and other auxiliaries added to the ship's equipment.

One of the outstanding features of the turbine is the oil impeller governor of latest design. The oil governor impeller and chamber are designed so that the oil pressure in the discharge from the impeller varies directly as the square of the revolutions per minute. The steam admission valve is controlled by the action of a piston opposing the oil pressure with the compression of a coil spring.

Among other main features of the new turbine are its simple sturdy construction and safety features. The set is designed so that the turbine cylinder base is integral with the gear housing base, and only one turbine gland is required. An external oil cooler with duplex strainer is used and an ejector oiling system with an auxiliary pump.

The turbine runs at 6600 revolutions per minute and the generator at 1200. With full load on generator one would hardly know standing right alongside that the machine is in operation.



The new Westinghouse 200-kilowatt turbo-generating set on the Matson Navigation Company's steamer Maui.

A New Marine Pump

THE Royer Hydraulic Drive Company, Seattle, Washington, has developed a very simple valveless pump to a high degree of efficiency. The firm is building this pump for marine purposes, and it is claimed that it is very well adapted for uses where compactness and steady operation are needed.

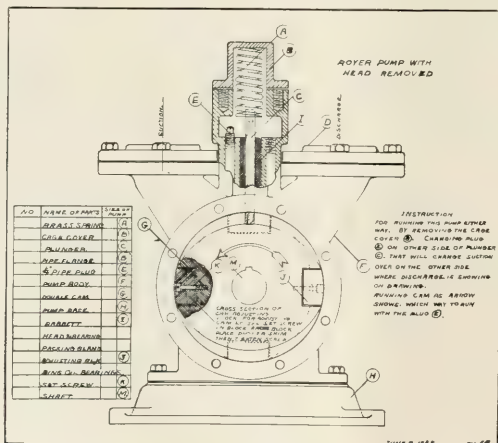
As shown by the illustration

herewith, there is but one moving part and that not subject to wear. It is also claimed that this pump will never lose its "prime," making it very desirable as a bilge pump. It can be run by electrical motor or other prime mover and is built, at present, in sizes up to 6 inches. 16-inch units.

Gasoline and other volatile fluids, as well as heavy oils and molasses, can be handled with equal facility. Severe tests of this pump have been made by some of the larger oil and industrial companies with very satisfactory results. The pump will and it is believed would do admirably create a 28-inch vacuum when dry, ably as a vacuum pump for condensers, as its valveless and noiseless features would be of advantage.

Among the marine companies using this pump are the Alaska Steamship Company, the Far West Fisheries, San Juan Fishing Company, Foss Tugboat Company, and the new Seattle workboat Lindy. The units are extensively used for individual water systems and shoreside plants.

The officers of the Royer company are Clarence Royer, president; Charles Saunders, secretary-treasurer; and M. S. Brustard, designing engineer.



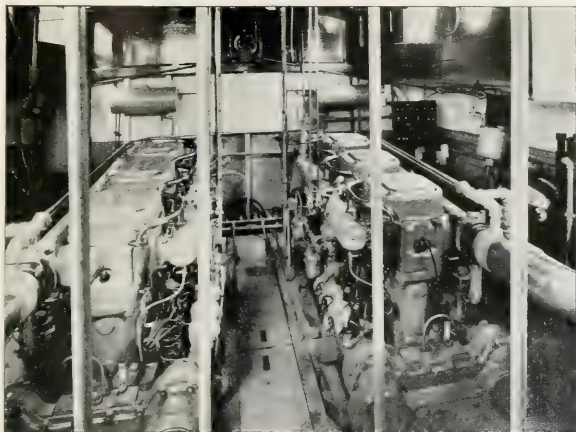
Vertical section through the Royer rotary pump.

A Smart Commuting Cruiser

PROMINENT New Yorkers living out on Long Island and with infrequent but occasionally important need of fast transportation are in some cases sharing the cost of commuting. The Argo, 60 footer, owned jointly by Mrs. Wilton Lloyd Smith and Mrs. Henry P. Davidson, is typical of the class. Professionally designed by John H. Wells and equally professionally built at the F. S. Nock yard, Argo looks every inch a thoroughbred. You know immediately that every detail was carefully planned and exactly and purposely adopted.

Naturally a smart appearing boat, the power plant had to be appropriate, and two Dolphin Model 225 H.P. six cylinder Sterlings furnish the 25 mile speed. They are moderate size engines, 5 $\frac{3}{4}$ " bore, finely balanced, using the counter-balanced crankshaft characteristic of Sterlings and with a wide foundation there is a noticeable absence of vibration. Oil coolers and strainers permit long running without overheating.

Good taste and harmony mark the arrangement of the cabin, which is forward, opening into a



The engine room of the Long Island Sound cruiser Argo, featuring two 6-cylinder Sterling Dolphin engines.

semi-enclosed forward cockpit protected by a glass shield. The most desirable and comfortable part of the boat is thus admirably arranged for day cruising.

that has worked out adequate solutions for practically every problem facing the fire fighter, and it can supply pumps of any required capacity or pressure for installation in city buildings, fireboats, fire engines, or salvage trucks.

This firm also manufactures boiler feed pumps, bilge pumps, condenser circulating pumps, oil transfer pumps, and all other types of centrifugal pumps used on ship-board.

Copies of the booklet will be sent on request to any one interested.

Trade Literature

Centrifugal Fire Pumps, Bulletin 228-F has just been issued by **Byron Jackson Pump Co.**, Berkeley, California.

This is a handsomely bound booklet of 36 pages, giving full particulars of the various types of centrifugal fire pumps manufactured by this firm. It is profusely illustrated

with views of various installations afloat and ashore. Insurance regulations governing the installation of fire pumps are discussed in detail for electric drive, for gasoline engine drive, and for steam turbine drive.

The Byron Jackson Pump Co. has an expert engineering organization

HYDROGRAPHIC MANUAL, prepared by J. H. Hawley for the use of hydrographic engineers, has been issued by United States Coast and Geodetic Survey, Washington, D.C.

The manual reflects the practical experience of the Coast and Geodetic Survey in its century and more of making accurate and comprehensive hydrographic surveys. It includes a discussion of the latest advances in hydrographic surveys, such as echo soundings, radio-acoustic sound ranging, and radio compass bearings.

Engineers who have reviewed it have declared this manual to be a distinct contribution to the science of hydrography in its practical application.



The cruiser Argo, 60 feet long, 12 feet 6 inches beam, 3 feet 6 inches draft, speed 25.2 miles an hour.

The Oil Tanker Explosion Hazard

By Warren H. Pillsbury,
Deputy Commissioner, Employees' Compensation Commission

TWO recent explosions upon oil tanker vessels have emphasized the hazard incident to transportation and storage of petroleum products.

On April 28, 1928, an explosion occurred upon the oil tanker *Richfield*, owned by the *Richfield Oil Company*. This vessel had just entered the San Francisco yards of the *Bethlehem Shipbuilding Corporation* for extensive repairs. The cargo tanks of this ship had been emptied of their load of gasoline the night before at Oakland, and some preliminary work done during the night towards cleaning the tanks from residual gasoline and gasoline fumes. The ship entered the yard, however, before the tanks had been freed from gas; the work of gas-freeing them was being carried on at the time of the explosion by a subcontractor of the ship yard. The source of the spark which ignited the fumes is not definitely known, but such spark might have come either from the tools then in use by workmen on the ship, the electrical blowers or their switches or connections, from static electricity, or many other possible sources.

After the conclusion of the various investigations carried on by state and federal authorities upon the *Richfield* explosion, I called a conference of representatives of the petroleum companies, shipbuilding and dry dock companies, insurance carriers, and others interested in the oil tanker hazard. This conference took place on May 29 and was well attended. The petroleum producing companies announced that they had completed an organization of all the companies represented on the Pacific Coast to conduct further investigation into the tanker hazard, with a view to searching for and ascertaining any possible means of increasing safety standards and to amend their rules covering tanker operations in the light of such additional information.

This organization is now functioning with the National Safety Council and with the Atlantic Coast and Gulf organizations representing the petroleum industry, to the end that the results of their work may be adopted nationally.

Certainly no group of men is better qualified than the executives, safety engineers, and technical staffs of the different oil companies to attack and solve the problem. The results of their investigations and conclusions are promised the federal government and others interested for use in safety work generally.

The representatives of the oil petroleum industry also announced at the conference that a resolution had been agreed to by all members of the industry on the Pacific Coast, to the effect that thereafter no oil tanker should be sent into any ship repair yard until it had first been made gas-free by the petroleum company. While this resolution will not apply to occasional oil tankers arriving in California ports from abroad, not owned by producing companies on the Pacific Coast, the ship repair and drydock operation appear to be equally desirous of having all tankers made gas-free before entering their yards for repairs. A resolution is now before the *Pacific Ship Builders' and Dry Dock Owners' Association* to exclude from ship yards all tankers until they have been made gas-free by the owners, which will probably be acted upon by the association in the near future.

If the measure to gas-free all tankers before they enter a ship yard becomes universally accepted, it will relieve ship yards, ship repair workmen, and owners of other vessels in ship yards from the danger of injury to life and limb of employees and of property damage, insofar as they are concerned. It is better for all parties concerned that the responsibility for freeing tankers from explosive gases remain upon the petroleum companies, who are best qualified to meet it.

Four days after this conference another explosion occurred upon the oil tanker *Helen Olmstead* in the yards of the *Los Angeles Shipbuilding and Dry Dock Corporation* at San Pedro, California. In this explosion, fortunately, but one man was hurt, his injuries not being serious, so far as reported at this time. The property damage to the ship was severe. It appears that the *Helen Olmstead* had been brought down the coast in ballast to enter the ship yard for repairs and that all of her tanks used for gasoline and petroleum products had been thoroughly cleaned at sea. Two sets of chemists are reported to have made tests of the air in each of these tanks at the time the ship entered the ship yard and to have pronounced the ship gas-free. Unfortunately, a certain cofferdam forward of the first tank, which had not been used for carrying petroleum products and had been sealed for several months, was not examined. In some unknown manner this cofferdam had become filled with gasoline vapors, and while the ship repair workmen were working upon the vessel these fumes became ignited, causing the explosion. The source of the spark igniting the vapors is not definitely known. It was remarkable that several of the repairmen were not killed. It is apparent from this explosion that further consideration is necessary of the methods of freeing tankers from explosive gases and of the tests to be made to determine whether the tanker is safe for operations.

The hazard of explosion in tankers or other vessels which have contained gasoline and other petroleum products should not be minimized. During the last ten years there have been a number of oil tanker explosions with a considerable loss of life in the aggregate. There is also a large danger of harm to surrounding property and workmen upon nearby docks, ships, etc.

A safety engineer has stated, though I can not vouch for his figures, that one gallon of gasoline properly vaporized contains the explosive power of 87 pounds of dynamite. When one considers the force generated in the engine of an automobile while consuming a gallon of gasoline upon the highway, the engineer's figures may not be excessive. The oil tanker probably constitutes the greatest single catastrophe hazard in operations coming within the provisions of the *Longshoremen's and Harborworkers' Act*.

While the writer is not officially interested in operations other than those coming under the *Longshoremen's Act*, it should not be forgotten that the hazard of explosion of gas fumes exists in many land industries. The storage and movement of gasoline and other volatile petroleum products has heavily increased in twenty years.

(California Safety News.)



Marine Insurance

Edited by JAMES A. QUINBY

Valued Cargo Policies In General Average Assured Held Coinsurer for Excess Over Insured Value

THE United States Circuit Court of Appeals for the Second Circuit has recently decided, in a case where the contributory value of cargo exceeded its insured value, that the insurer is liable in general average only for the rateable proportion which the insured value bears to the contributory value. (*Gulf Refining Company versus Atlantic Mutual Insurance Company*, reversing the decision in 1927 AMC 1669).

The question involved is one on which authorities in England and the United States have been at variance for some years. It is usually clouded by a technical manner of discussion, which may be dispensed with for the sake of clearness. Briefly, the point may be stated as follows: If I insure my goods for \$1000 valued at \$1000, and the goods become liable for a general average contribution of \$100, based upon a contributory value of \$2000, is my insurer liable for \$100 or \$50?

English Versus American Rule

English Courts have consistently protected the insurer in such cases by allowing the assured to recover only pro rata under his policy; in other words, declaring that the assured is in fact a coinsurer to the extent by which the contributory value exceeds the insured value. The English law was settled in 1902 by a decision of the House of Lords in *Steamship Balmoral Co. versus Marten*, L. R. 1902, (App. Cas.) 511, where, in a case of salvage, the hull value exceeded the policy valuation, and it was held that the hull underwriters were liable only for that proportion of the salvage and general average loss which the policy value bore to the true value.

Four years later the doctrine was expressly incorporated in Section 73, Subsection 1 of the Marine Insurance Act of 1906 (English) in the following terms:

"Subject to any express provision in the policy, when the assured has paid, or is liable for, any general average contribution, the measure of indemnity is the full amount of such contribution, if the subject-matter liable to contribution is insured for its full contributory value; but if such subject-matter be not insured

RONDO

When I started in business importing tin snices,
And geekles and doodle-bug wings,
I bought through my brokers, McSwiggle and Croker-
Insurance on all of these things.
For the space of a year the untroubled career
Of my policy rambled along,
While a broker named Bailey accosted me daily
And sang me the following song:

(Chorus)

The brokers you now have are good ones, that's true,
But we give better service than they—
They send you a statement when premiums are due.
While we come around every day.
Improve your position! Promote competition!
Just give us a trial, we pray.

At length I admitted the facts he submitted
Were quite undeniably true.
So I fell for this joker and made him my broker,
Now my troubles confront me anew.
For he keeps himself hid like my old broker did
Till the end of the month comes along,
While eight other cash-cravers solicit my favors
As they warble the following song:

Chorus: (Repeat ad lib.) J. A. Q.

for its full contributory value, or if only part of it be insured, the indemnity payable by the insurer must be reduced in proportion to the under insurance."

The Maldonado Case

In 1910, the Circuit Court of Appeals for the Ninth (Pacific) Circuit, reached a conclusion contrary to the English doctrine in the case of *Maldonado versus British & Foreign Marine Insurance Co.*, 182 Fed. 744. In that case the insurer issued a policy covering a cargo of kapok with an agreed insured value of \$48,632. In a subsequent general average, the goods were found by the adjuster to have an actual contributory value of over \$66,000, against which was assessed a contribution of \$22,544.77.

The Court, in holding the insurer liable for the full amount of the contribution, follows certain earlier cases in New York, based upon the Code of Civil Procedure of New York, Sec. 1511, which is closely followed by Sec. 2744 of the Civil Code of California, reading as follows:

"A marine insurer is liable for a loss falling upon the insured, through a contribution in respect to the thing insured, required to be made by him towards a general average loss called for by a peril insured against."

The doctrine of the Maldonado case, making the insurer liable for the full contribution up to the amount of the policy, has been termed the "New York rule," while the coinsurance theory has been called the English or "Boston" rule, having been followed in this country by the Courts of Massachusetts.

The Maldonado case apparently stands as good law on the Pacific Coast, the Supreme Court having denied a writ of certiorari (220 U.S. 662).

Two Lines of Cases in America

There are thus two sharply divergent lines of decision in American Courts, and no surprise was occasioned by the action of Commissioner Veeder of the District Court for the Southern District of New York when, in June 1927, he handed down a decision upholding the right of an assured to recover his contribution in full from his underwriter, even though the

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contributory value was far in excess of the insured value.

(The *Gulflight*, 1927 A M C 1669)

"On Principle," says the Commissioner, "it seems to me that where the general average is payable by the assured in respect of a loss covered by the policy, the amount which the assured has been obliged to pay is the amount which he ought to recover in order to give the assured the indemnity which the policy is intended to afford him. Apart from the question of policy valuation, the liability of the underwriter is to reimburse the assured in respect of the latter's liability for general average contribution; and the underwriter is concluded by such liability as lawfully established between the respective interests under the contract of affreightment. It is to be presumed that both the underwriter and the assured are familiar with the business in respect to which they contract. It is well known to both parties that the assured may be required to pay general averages with respect to losses insured against. They know that these averages may be adjusted abroad, and that the values will be fixed at destination. Moreover, in case of salvage, an entirely new element enters into the computation of the property saved; viz., the risks and dangers encountered by the salvors. Accordingly, it is now established law that the underwriter is bound by an adjustment properly made in a foreign port in accordance with the foreign law, although both the contributory interests and the sum to be contributed may be based upon principles different from those which prevail at the place where the contract of insurance is made."

Gulflight Reversal Undermines New York Rule

The Circuit Court of Appeals for the Second Circuit has now reversed the above decision, expressly denying the authority of former New York cases and the *Maldonado* case. The reversal is a distinct effort to bring the American rule into accord with English law, thus definitely placing upon the assured the burden of a coinsurer of general average where the contributory value of his cargo exceeds its insured value. After discussing the admitted practice of settling insurance losses on a coinsurance basis in cases of particular average on goods, the court proceeds to the conclusion that general average should be treated likewise and disposes of contrary authority in the following language:

"In general therefore it appears to us that since coinsurance is right in principle, and is admittedly the law as to partial losses, it should apply to general average contributions. We can find nothing to the contrary in the books except *British*, etc. Co. v. *Maldonado & Co.*, 182 Fed. Rep. 774 (C. C. A. 2), and an early New York case, *Strong v. Firemen's Ins. Co.* 11 Johns. 323, in which the chief point discussed was as to the proper place at which the adjustment should be com-

puted. The question of whether, when the amount was reached, the underwriter was liable in toto was assumed. Except for the law relating to hulls, we should be reasonably confident that the respondent was right, in spite of our unwillingness to differ with our brothers in the Ninth Circuit."

The Court then goes on to discuss reasons for a difference in hull practice (i.e., chiefly the fact that hulls are not objects of commercial barter) and, with a definite pronouncement of the coinsurance principle, reverses the District Court and dismisses the assured's libel.

The Ninth Circuit thus stands alone in its theory of complete recovery. It is hoped that the *Gulflight* case may be carried to the Supreme Court, in order that this radical divergence in our Federal Courts may be terminated.

Bill of Lading in California Court

IN one of the few admiralty cases recently tried in California courts, the Supreme Court of that state, on August 24, 1928, ruled that a carrier may not rescind an agreement to furnish refrigerator space after issuance of a bill of lading, even though the consignee waived the requirement of refrigeration, where it appears that the waiver was withdrawn before the vessel sailed. (*Atlantic Fish Co. vs. Dollar S.S. Line No. 12788.*)

In July, 1924, the Atlantic Fish Company, a copartnership composed of the Colety family, purchased from Gloucester, Massachusetts, a quantity of codfish in cases, to be shipped from Boston to San Francisco under refrigeration per the steamship *President Hayes*. On August 12 the shipment was received by the vessel and a bill of lading issued providing for refrigerated carriage.

On August 13, while the vessel was between Boston and New York, the shipper wired the consignee as follows: "Dollar Line advise refrigerator compartment on *Hayes* disabled. Unable to handle shipment under refrigeration. Goods now on board bound for New York. Can store where it will receive ventilation. Shall we authorize or have shipment held at New York for next steamer. Answer quick."

On August 14, when the wire was received by the consignees in San Francisco, Mr. Colety, senior, was absent from his office, and the junior partner replied to the telegram as follows: "Authorize *Hayes* shipment to come through under ventilation."

When the senior Colety returned on the morning of August 15, he immediately called at the San Francisco

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ATLANTIC MARINE DEPARTMENT
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09 COLMAN BUILDING, SEATTLE, WASHINGTON

office of the Dollar Line and pointed out that it would be unsafe to bring the shipment through the Canal without refrigeration. Mr. Herman, of the Dollar Line, assured him that the Hayes would be repaired at New York and the goods shipped under refrigeration as ordered.

Ten days later Colety received by mail a bill of lading which showed that the goods were coming under ventilation only. He was again assured that the goods were actually under refrigeration. When the Hayes arrived at San Francisco, it was found that the fish had been carried under ventilation only, and had been damaged because of lack of refrigeration.

In the Superior Court, the plaintiff gained a decision against the carrier, but the same court granted an order for a new trial, which order was affirmed by the District Court of Appeal (54 Cal. App. 786). In reversing the order of the Superior Court, the Supreme Court comments as follows:

"When defendant issued to the shipper for the benefit of plaintiff its first bill of lading providing for refrigeration and accepted said goods under such contract on board its vessel, it then and there covenanted on sufficient consideration to carry said goods from Boston to San Francisco under refrigeration. The subsequent consent of plaintiff to a change in the character of the stowage, secured through the wires of August 13 and 14, was revoked or withdrawn before the consent to modification had been acted upon and a new bill of lading issued. The Consent to the modification of the former valid and already issued bill of lading was without any consideration to support it until it had been acted upon by the carrier and was, therefore, subject to withdrawal at any time before the defendant had suffered any detrimental resulting therefrom. In other words, plaintiff received no consideration for the consent secured from it, and defendant suffered no detriment on account thereof. The senior member of the firm, acting for plaintiff, withdrew such consent within twenty-four hours after same was given and clearly before the change was acted upon by defendant to its detriment. Therefore, the first bill of lading, from and after its issuance, remained the true contract between the parties and defendant was required thereunder to transport said goods under refrigeration. Having failed to do so, the verdict and judgment against it were proper (Civ. Code, Sec. 1605; Western Lith. Co. vs. Vanomar Producers, 185 Cal. 366, 369)."

Mixed Cargo

With at least one Pacific Coast underwriter, the noble virtue of brutal frankness may temper the biting wind of criticism. It seems that George Jordan, the

effervescent dynamo behind the marine department of the Fireman's Fund Insurance Company, upon learning that an acquaintance had by innuendo attributed to him a misstatement of fact, erupted as follows:

"I wouldn't mind if he called me a damn liar, but I won't stand for anybody casting doubts on my veracity!"

Come to think of it, there is a subtle distinction. It goes without saying that the veracity of our friend George is beyond reproach, or he could never afford to make such a statement.

We sometimes wonder as to the veracity of skippers who sign extended protests noting heavy weather. On a translation of such a document, signed by a Japanese master at Yokohama, appears the following:

"Fearing consequences and damage, undersigned has oathed as above."

Not a bad translation, at that.

And while we're on the subject of veracity, we recall the testimony of the crews of the Suremico and the Arkansas after those vessels crashed off Tatoosh last year. To a man the noble mariners swore that their respective vessels had been making sternway at the time of the collision. It was, by the way, a head-on collision.

There is, moreover, that famous—or notorious—case which came up in a Federal tribunal last year, involving a questionable entry in an engineer's log. The log book had been introduced in evidence, and the entry in question, which was diametrically opposed to other testimony, appeared on page 62.

In appearance, that page bore every resemblance to the pages surrounding it. The same ink, the same handwriting—even the same smudges of oil and grease gained ostensibly from kicking around the engine-room during the course of the voyage. But the astute gentleman who had interleaved the substitute page had forgotten one thing. The back of the book, when removed, showed one folded edge of a single sheet to be of a pristine whiteness, while the rest of the folded edges were weathered by age. One instance where cleanliness and godliness had little in common.

Apropos of little or nothing, save the fear of closing on a cynical note, we record the fact that there is a firm of importers in Calcutta known as Gangooly, Shaw, Chuckerbutty & Co.

Odd names are apt to be more or less a matter of nationality. A long undusted corner of memory fur-

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nishes a picture of a former manager of the East Asiatic Company in San Francisco, convulsed with laughter at the name of a well-known surveyor who had examined

a shipment of his merchandise.

"Of all things," he gasped, "his name is Pamphilon!"

The convulsed manager's name was Jellstrup.

New Books

COMMERCE YEARBOOK, 1928.

Issued in two volumes by the United States Department of Commerce. Published by Government Printing Office, Washington, D.C. Price \$1.

The Commerce Yearbook, the official survey of our commerce and industry issued annually by the Department of Commerce, is of particular value to foreign traders, bankers, economists, and students. Volume I (United States) presents in concise and readable form all essential data bearing on the economic life of the United States during 1927. Volume II (Foreign Section) contains the latest available data from official and other reliable sources on foreign markets, together with maps, charts, and tables.

BROWN'S NAUTICAL ALMANAC.

1929 edition. Published by Brown, Son & Ferguson, Ltd., 52 Darnley Street, Glasgow, Scotland. Price 3 shillings net.

The publishers of Brown's Nautical Almanac, 1929, in presenting this 52nd edition to the public, call special attention to several important changes which should be of interest to the general public as well as the navigator. The changes are the introduction of letter R in place of Right Ascension of the Mean

Sun and letter E in place of Equation of Time, due to the changing of the commencement of the astronomical day from noon to midnight.

The publishers have made every effort to incorporate in this volume the latest developments in nautical science and maritime procedure.

SUPERHEAT ENGINEERING

DATA, a handbook on the generation and use of superheated steam and related subjects; 7th edition; published by The Superheater Company, 17 East 42nd Street, New York. Price \$1.

This is a handbook for steam power plant engineers and operators. It contains condensed data, carefully indexed for ready reference. While not intended to displace standard handbooks, it contains much data that can be found in no other single publication. For instance, the steam tables give properties of saturated and superheated steam to 3500 pounds absolute pressure. There are illustrations of practically all American types of stationary boilers and steam superheaters. Brief comparative figures are given about the boilers as to sizes, tube sizes, and arrangement of tubes. The approved tentative American Standard for cast iron pipe flanges and steel pipe flanges and flanged fittings are also included.

Trade Literature

Ross Heater & Mfg. Co., Inc., Buffalo, New York, has recently issued a very fine catalog covering its line of heat transfer equipment, steam jet vacuum pumps, expansion joints, and strainers.

The catalog is unique in that it is made up of loose leaf sections placed in a neat paper binder. Only those bulletins covering items of Ross equipment in which an applicant is interested are included in the loose leaf catalog binder, which

may be added to from the published list of items manufactured by the company. The catalog is profusely illustrated with pictures of products and their various installations, graphs, etc.

Shipmate Gas Ranges is a catalog which should be in the hands of every designer and builder of yachts, cruisers, fishing vessels, tugboats, dredgers, ferryboats, and all other moderate size vessels in

which a compact, clean, safe, and convenient range is required.

Shipmate gas ranges are real vessel ranges and capable of doing all sorts of cooking, including broiling. The fuel is nonpoisonous and is contained in steel cylinders. This neat little catalog explains the process of generating the gas and illustrates and describes the various types and sizes of ranges and their equipment.

Copies may be had by addressing the main office at Stamford, Connecticut, or C. J. Hendry Company, ship chandlers at San Francisco and San Pedro.

New Departure Mfg. Co., Bristol, Connecticut, with branches in Detroit, Chicago, and San Francisco, has recently issued a descriptive catalog entitled "More and Better Production at Less Cost—what New Departure Ball Bearings mean to Machine Tools."

Falk Flexible Couplings (Bibby Patent) is catalog No. 150 issued by The Falk Corporation, Milwaukee. This catalog explains the uses of the flexible coupling, gives directions how to select couplings, and is illustrated with pictures showing the various features of this coupling and with graphs and tables of dimensions, service factors, etc.

Falk Speed Reducers is the subject of Bulletin 160 issued by The Falk Corporation, Milwaukee. This is a very complete and well prepared catalog and gives all possible information relative to Falk herringbone gear speed reducers. It contains reproductions of blue prints and applications and complete tables covering single, double, and triple reduction units.

These two catalogs may be obtained from the main office, or from any branch representative. E. C. Myers, 533 Market Street, San Francisco, is California representative.

TRADE NOTES

Air Reduction Company, Inc., on August 1, purchased the business and property of the Ohio Oxygen Company, Niles, Ohio. This purchase adds one more oxygen plant to the production and sales facilities of the Air Reduction Company, Inc., and the Air Reduction sales Company, making thirty-seven oxygen plants located in the principal industrial centers



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

RENT SHIPBUILDING CONTRACTS

Bethlehem Received Order for Ship to Waialeale.

A. H. Armitage, general manager of the Inter-Island Steam Navigation Company, Honolulu, was recently in San Francisco and placed an order with the Bethlehem Shipbuilding Corp., Ltd., for a sister ship to the steamer Waialeale for service between Honolulu and other ports of the Hawaiian Islands.

The steamer Waialeale was completed by the Bethlehem Shipbuilding Corporation and delivered to her owners on May 31 of this year. She has twin screws, is 295 feet between perpendiculars, 48 feet beam, 17 feet 4½ inches draft, 15 knots loaded speed, and of 1800 deadweight tons. Power plant consists of Westinghouse complete expansion geared turbines and electric motors developing 4000 shaft horsepower. Steam is supplied by four Babcock & Wilcox water-tube boilers of 12,268 square feet heating surface.

The Waialeale has a passenger capacity of 212 in first class and 96 in third class. She has cargo capacity of 1170 tons and space for 20 tons of automobiles. The owners report her to be a very popular and satisfactory vessel in every respect. Her cost was \$1,500,000.

Moore Dry Dock Company, Oakland, California, has been awarded the contract for the diesel-electric ferryboat for the San Diego-Coronado Ferry Company, a subsidiary of the Spreckels interests at San Diego.

She will have the following dimensions:

Length over-all	190'0"
Length between perpendiculars	178'0"
Breadth over guards	60'0"
Breadth of hull	43'6"
Depth molded	14'9"
Draft	8'11"

The boat will be double-ended, with a propeller at each end. She will be equipped with two Atlas-Imperial diesel engines each of 500 brake horsepower, which will be

connected to two 750 shaft horsepower Westinghouse motors, one driving each propeller. She will be built to the classification of the American Bureau of Shipping.

Coast Line Shipbuilding Company, Tacoma, Washington, received the contract for construction of a fireboat for the City of Tacoma; 95 ft. 6 in. over all; 21 ft. 6 in. beam; 6 ft. draft; three 6-cyl. Sterling-Viking gas engines 425 B.H.P. each; De Laval pumps; cost \$140,285.

The Pusey & Jones Corp., Wilmington, Delaware, has contract for twin screw diesel yacht for Arthur E. Wheeler, New York; 126 ft. over-all; 21 ft. 6 in. beam; 8 ft. 6 in. draft; 2 250-B.H.P. diesel engine.

Federal Shipbuilding & Drydock Co., Kearny, N. J., has order from Oil Transfer Corp., New York, for two oil barges; one to be 175 by 36 by 12 ft. 6 in.; the other to be 146 by 34 ft. 8 in. by 10 ft. 2¼ in.; this yard also has order from J. W. Sullivan Co. for lighter hull 121 by 32 ft. 6 in. by 13 ft. 4½ in.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., has order from Great Lakes Dredge & Dock Co., Chicago, for diesel-electric dipper dredge; 151 L.B.P.; 43 beam; 10 ft. draft aft.

Dravo Contracting Co., Pittsburgh, Pa., has order from Union Barge Line, Pittsburgh, for 9 steel hopper barges 175 by 26 by 11 ft.; also from Mississippi River Commission, Memphis, for 32 standard barges.

Midland Barge Co., Midland, Penn., has an order from Union Barge Line, Pittsburgh, for three fuel barges 100 by 24 by 8 ft.

Nashville Bridge Co., Nashville, Tenn., is building 80-ft. dredge for stock.

George Lawley & Son Corp., Neponset, Mass., has an order from Carl Tucker for a 209-ft. auxiliary schooner diesel yacht; cost \$850,000.

Todd Engineering, Drydock and

Repair Co., Brooklyn, has order from Dept. of Plant and Structure, City of New York, for double-end steel ferryboat; 151 by 53 by 8 ft. 3 in. draft; cost \$353,241.

Fogal Boatyard, Miami, Florida, has order for 130-ft. twin screw, Sterling gas engine powered houseboat for W. H. Vander Poel; cost \$275,000.

Dubuque Boat & Boiler Works, Dubuque, Iowa, has order from U. S. Coast Guard Service, Washington, D. C., for a floating Coast Guard station; 90 ft. 4 in. over-all; 38 ft. beam; 2 ft. 9 in. draft; cost \$29,875.

Yuba Manufacturing Co., Marysville, Calif., has order for giant dredger for Anglo-Oriental Mining Co., to be used in tin mining in the Orient and to cost \$600,000.

Gust Calen, Aberdeen, Wash., a newly established shipyard, has an order for a deepsea trolling boat.

Harbor Boat Building Co., East San Pedro, Calif., has an order for a cruising yacht for Joseph Logel of Santa Monica; twin screws; 80 ft. length; Union diesel engines; \$55,000.

Maryland Drydock Co., Baltimore, has been awarded contract by the Shipping Board for the conversion of the steamers Galveston and Oldham to diesel power. McIntosh & Seymour diesel engines will be installed; cost of conversion is \$1,064,368.

Small Boat Building Active on San Francisco Bay

As we go to press we learn of three new orders for small craft placed at San Francisco Bay Shipyards.

Bethlehem Shipbuilding Corporation, Ltd., San Francisco, has an order for a steel oil tank barge for the Standard Oil Company (Calif.) which is to be used for Sacramento or San Joaquin river deliveries. She will be powered with gas engines.

General Engineering & Drydock Company, Alameda, California, has contract from the Standard Oil Company (Calif.) for a steel tow-barge, which is to be knocked down

for shipment by the company to another port.

This yard has also received an order for a wooden hull fishing boat for A. Paladini, Inc., San Francisco, which is to be similar to the Catherine Paladini just completed. The Catherine Paladini is 78 feet long

and is powered with Atlas-Imperial diesel engines of 200 horsepower.

Albina Marine Iron Works, Portland, Oregon, has an order for a 65-foot diesel towboat for Captain Milton Smith, Rainier, Oregon, to be powered with a 250-horsepower Atlas-Imperial diesel engine.

Shipbuilding Work in Prospect

Two 25,000-Ton Craft Planned For San Francisco

The Matson Navigation Company, according to news from authoritative sources, has completed plans for the construction of two de luxe liners for the San Francisco-Australia service of the company. The vessels will be built under provisions of the Merchant Marine Act, 1928. According to these reports, the vessels will be 720 feet long, of 25,000 tons gross, and have a sea speed of 20 knots. Geared turbines will be the propulsion power. The estimated cost of such craft is \$10,000,000 each, and they will be the finest vessels plying the Pacific Ocean, embodying every modern convenience and comforts as well as all the latest refinements in machinery and safety equipment.

Plans to Be Announced Shortly For Export Line

Plans for four passenger and freight vessels for the Export Steamship Corporation of New York have been completed by Naval Architect George G. Sharp, 30 Church Street, New York, and call for ships of the single-screw, shelter deck type, 450 feet between perpendiculars, 59 feet molded beam, 46 feet 6 inches molded depth. The plans for the vessels are ready to issue to the shipyards as soon as the loan fund under the Merchant Marine Act, 1928, has been arranged for their construction.

Announcement from A.G.W.I.

It is reported in New York that the Atlantic, Gulf & West Indies Steamship Company, of which Franklin D. Mooney is president, has plans under way for two combination liners of 11,300 tons gross, 18 knots speed, and to accommodate 378 first-class and 91 second-class passengers.

Plans were made by Theodore E. Ferris, 30 Church Street, New York. The vessels will be 508 feet long over-all, 69 feet 8 inches beam,

26 feet loaded draft. They are to have twin screws and propulsion power will be developed by single reduction turbines.

The vessels will be put into the service of the Ward Line (New York & Cuba Mail Steamship Company) in its New York-Havana route, for which the company has received a mail subvention under the Merchant Marine Act, 1928.

New Pilot Boat for San Diego.

The San Diego, California, Harbor Board has announced that bids will be called soon for the construction of a pilot boat to cost around \$20,000.

Bids Called on Freighters

Naval Architect George G. Sharp and Architect and Marine Engineer James Donald, at 30 Church Street, New York have called for bids for the construction of a self-unloading bulk cargo carrying vessel for the Pan-American Industrial Corporation, Buenos Aires. The vessel is to be 450 feet long, 68 feet beam; 35 feet depth, single-screw, driven by geared turbines; conveyors, deck machinery, and all auxiliaries to be operated by electricity, developed by turbo-generators. The deadweight capacity of the vessel will be 9000 tons and it will be equipped with ample conveyor machinery to unload at the rate of 2000 tons an hour.

Burrard Dry Dock Co. Low Bidder

The Burrard Dry Dock Co., North Vancouver, British Columbia, was low bidder on construction of an oil tank barge for British Columbia coastwise deliveries of the Union Oil Company of California, with headquarters at Los Angeles.

Atlantic Coastwise Freighters Planned

According to reports from New York, Burgess & Morgan, 11 Broadway, are designing two 250-ft. freighters for the Bee Line and one 160-ft. auxiliary powered schooner.

Bids Opened on New Lightships

The Bureau of Lighthouses, Department of Commerce, Washington, D. C., opened bids on September 6 for the construction of three additional lightships, similar to the three now under construction at the Albina Marine Iron Works, Portland, Oregon.

Albina Marine Iron Works was low bidder at \$182,000 for each vessel, or \$546,000 for three. Other bidders were:

American Brown Boveri Electric Corp., \$588,000;

Staten Island Shipbuilding Co., \$637,400;

Sun Shipbuilding Co., \$649,800;

Charleston Drydock & Machinery Co., \$661,000;

Bath Iron Works, \$687,200;

New London Ship & Engine Co., \$688,500.

Federal Shipbuilding Co., \$738,000.

While the bid of the Portland firm is the lowest submitted, the tender was not received at the office of the Bureau until an hour after the official time for the opening of bids. The boats are for delivery on the Atlantic Coast and bids were not requested from West Coast yards. Due to these two factors, officials of the Bureau were not certain of awarding the contract to the low bidder.

REPAIRS

Bethlehem Shipbuilding Corp., San Francisco, is repairing the steamer Calmar, which was damaged in collision with the steamer Canadian Rover near Point Reyes the early part of September. The machinery will have to be removed, repaired, and replaced.

The Sea Rover was temporarily repaired at San Francisco to enable her to get to Vancouver for inspection.

Tedd Dry Docks, Inc., Seattle, has repair contract on the oil tanker Petroleum No. II, which was damaged by fire recently.

This plant is also repairing the steamer Admiral Fiske of the Pacific Steamship Company, this vessel having had her bow badly damaged in collision with the Floridian, which sank.

Los Angeles Shipbuilding & Drydock Corp. recently reconditioned the steamer Pawlet. The work was done for the Shipping Board, who turned the vessel over to her purchasers, the Oceanic & Oriental Steamship Company.

Launching of Liner Virginia

Marking another step in the advancement of the Panama Pacific Line in its ideal of excellence of service between the East Coast and California, the turbo-electric liner Virginia was launched on August 18 by the Newport News Shipbuilding & Drydock Company.

The vessel was sponsored by little Miss Anne Thomas, daughter of J. H. Thomas, vice-president of the International Mercantile Marine Company. She was attended by Miss Frances Randall Williams, daughter of Captain Roger Williams, operating manager of the International Mercantile Marine Company, and by Miss Eleanor McCarthy, daughter of A. J. McCarthy, general manager of the Panama Pacific Line. Others on the launching stage were P. A. S. Franklin, president, and J. H. Thomas, vice-president of the I.M.M., and Mrs. Thomas. Promptly as the Virginia started to move, Miss Thomas crashed the bottle of California champagne against the hull with a very effective aim.

The Virginia is a sister ship of the California, which went into service in February of this year, although slightly longer and different in several minor details. She is 613 feet 3 inches over-all, 80 feet beam, 52 feet depth. Her power is supplied by General Electric turbo-generators, each of her twin propellers being driven directly by an 8500 horsepower motor. Babcock &

Wilcox water-tube boilers supply steam to the turbines.

The Virginia is designed to accommodate 400 first class and 400 tourist class passengers, all in outside state-rooms. Her furnishing and accommodations will be as beautiful and tastefully comfortable as those of her sister ship the California.

A third vessel for the service of

the Panama Pacific Line has been ordered from the Newport News Shipbuilding & Drydock Company, keel for which will be laid October 15.

Annual Report of American Shipbuilding Co.

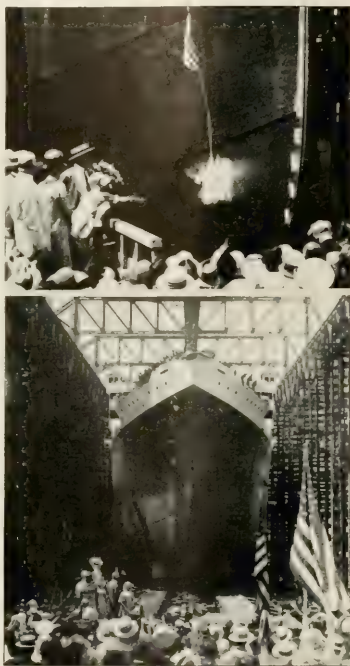
According to the annual report of the American Shipbuilding Company of Cleveland, issued August 21, the company realized a net profit for the fiscal year ending June 30, 1928, of \$510,695.44. President W. H. Gerhauser reports that business of the company during that period was much smaller in volume than for the preceding year, due to small amount of new ship construction, being nearly four million dollars less; repair business and miscellaneous contracts were only slightly less.

The company owns and operates the Chicago Ship Building Company at Chicago; Detroit Shipbuilding Company, Detroit; The Superior Shipbuilding Company, Superior, Wis.; Buffalo Dry Dock Company, Buffalo; Milwaukee Dry Dock Company, Milwaukee; as well as The Independent Steamship Company, which is now inactive.

Current American Shipbuilding

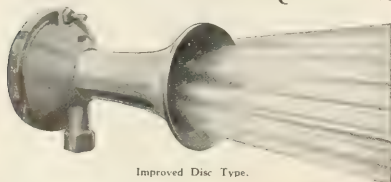
On August 1, 1928, American 42,557 gross tons building or under contract to build for private ship-owners 377 steel vessels of 213,817 gross tons compared with 396 steel vessels of 225,740 gross tons on July 1, 1928, according to the Bureau of Navigation, Department of Commerce.

There were 78 wood vessels of 42,557 gross tons building or under contract to build for private ship-owners during the same period compared with 87 wood vessels of 38,670 gross tons on July 1, 1928.



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The McCaffrey Co. San Diego

KEEL LAYINGS

Steam lighter for Pennsylvania Railroad by American Brown Boveri Electric Corp., Sept. 1; three carfloats for same, Aug. 21, Aug. 26, Aug. 11.

Four steel needle flats for U.S. Engineers, Louisville, Ky., by Howard Shipyard & Dock Co., Aug. 7.

Diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., by Manitowoc Shipbuilding Corp., Aug. 30.

Barge for Heekin Can Co., Cincinnati, by Midland Barge Co., during August.

Four cargo barges for stock by Nashville Bridge Co., Aug. 22 and 27.

P.R.R. No. 17 and L.I.R.R. No. 1, two harbor tug hulls for Pennsylvania Railroad by The Pusey & Jones Corp., July 12.

Fire and patrol boat for Commissioners, Washington, D.C., by Spedden Shipbuilding Co., Aug. 25.

LAUNCHINGS

Scow by J. C. Johnson's Shipyard, Port Blakely, Wash.

Sixteen discharge pontoons for U.S. Engineers, by Midland Barge Co., during Aug.; six deck scows for Division of Canals and Waterways, State of New York, during August.

DELIVERED

Scow to Tacoma Tug and Barge Co. by J. C. Johnson's Shipyard, Port Blakely, Aug. 7.

Three carfloats to Pennsylvania Railroad by American Brown Bo-

veri Electric Corp., Aug. 14, 21, and 28.

Whim III, commuter boat to Harrison Williams by Consolidated Shipbuilding Corp., in August.

Two steel barges to Hainsport Mining & Transp. Co. by Dravo Contracting Co. in Aug.; three steel sand and gravel barges to Keystone Sand & Supply Co.

Three barges to U. S. Engineers, Huntington, by Howard Shipyard & Dock Co., Sept. 1.

Catherine D., diesel towboat completed by Nashville Bridge Co., Sept. 1 two deck barges Aug. 14.

Two carfloats to Reading Railroad by Sun Shipbuilding Co., Aug. 9 and 16.

Incor, twin screw towboat for International Cement Corp., by Charles Ward Engineering Works, Aug. 19.

General Engineering & Drydock Company, with head office in San Francisco, which has just purchased the plant of the Hanlon Drydock & Shipbuilding Company, Oakland, has announced the installation of one of the largest forge presses in the world at this plant, brought from the Forrester Forge Co. The press will have a capacity of 1000 tons, and will handle any size of ship forging likely to be required by Pacific Coast shipbuilders.

The company, with its three plants—in San Francisco, Alameda, and Oakland—is now in a position to build any type or size of steam or motor liner, fishing boat, ferry boat, or pleasure vessel.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of September 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length overall; 30' beam. Winton diesel engs; General Electric motors; keel Sept. 1/28 est. Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY, Seattle, Washington

Mikimiki, hull J. 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs; keel Sept. 12/28.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco
Purchasing Agent: C. A. Levinson.
Three steel dredge hulls for U. S. Smelt-

ing, Refinery & Mining Co., Oakland, Calif.. 100x50x11'4"; 6 cu. ft. buckets.

GENERAL ENGINEERING & DRY DOCK CO. Alameda, Calif.

Purchasing Agent: Geo. Armes.
Catherine Paladini, hull 16, fishing boat for A. Paladini, Inc., San Francisco; 78' x 18'6" x 6'6"; 10 loaded speed; 200 H.P. Atlas-Imperial diesel eng.; launched July 14/28.

Hulls 17 and 18, mud scows for Board of State Harbor Comm.; 102 x 29 x 9'3"; delivery July 20/28 est.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wash.

Scow for Tacoma Tug & Barge Co. 100 x 36 x 9'6"; launched and delivered Aug. 7/28.

Scow same as above, launched Aug. 13/28.

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.

THE MOORE DRY DOCK CO.

Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Western Pacific

Railroad, San Francisco; 258' L.O.A.; 38' beam over-all; 12'6" molded depth; 79' loaded draft; capacity 14 80-ton cars; launch Sept. 28/28 est.; deliver Oct. 10/28 est.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est.; deliver Nov. 10/28 est.

One steel clam shell dredger for Board of State Harbor Commissioners, San Francisco; 90' x 41 x 12'9"; launch Oct. 10/28 est.; deliver Nov. 30/28 est.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28 est.; deliver Jan. 10/29 est.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

One towboat hull for Tennessee Coal, Iron, & R. R. Co.; 140'x25'x7'; delivered Aug. 30/28.

Ten covered barges for Carnegie Steel Co.; 175x26x11 ft.

Nine coal barges for Union Barge Line, 175x26x11'.

Thirty Mississippi River Commission barges for; 120x30x7'.

One acid barge for American Steel Wire Co.; 10x26x7 ft.

One towboat hull for Tennessee Coal, Iron & R.R. Co.; 140x25x9'.

AMERICAN BROWN-BOVERI ELECTRIC CORP., Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Chester, light cruiser CL 27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 1/28; deliver Dec. 28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel Aug. 21/28; deliver Oct. 2/28 est.

Hull 381, carfloat for Pennsylvania Railroad Co.; keel June 12/28; launched Aug. 2/28; delivered Aug. 14/28.

Hull 382, same as above; keel June 12/28; launched Aug. 9/28; delivered Aug. 21/28.

Hull 383, same as above; keel June 26/28; launched Aug. 16/28; delivered Aug. 28/28.

Hull 384, same as above; keel July 19/28.

Hull 385, same as above; keel Aug. 6/28.

Hull 386, same as above. keel Aug. 11/28.

THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

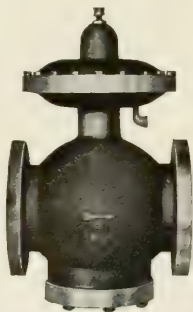
Purchasing Agent, C. H. Hirschinger.
Martha E. Allen, hull 803 motor tanker for Lake Tankers Corp.; 334 L.B.P.; 51 ft. beam; 18 loaded draft; 11½ mi. loaded speed; 3700 D.W.T.; 1900 I.H.P. Werkspoor diesel engs; aux. Scotch boiler; keel Dec. 12/27; launched June 9/28; deliver Sept. 7/28 est.

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BATH IRON WORKS

Bath, Maine

Vanda, hull 117, twin screw steel diesel yacht, 240"x36"x22'; two 1500 B.H.P. Bessemer diesel engs.; keel Feb. 3/28; launch Oct. 3/28 est.; deliver Oct. 24/28 est.

Boston College, hull 119, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123"x23"x14'; 400 B.H.P. Fairbanks-Morse diesel engine. Bath Iron Works design. Keel June 14/28; launch Oct. 1/28 est.; deliver Oct. 15/28 est.

Holy Cross, hull 120, trawler, same as above; keel June 14/28; launch Nov. 1/28 est.; deliver Nov. 5/28 est.

Georgetown, hull 121, trawler, same as above; keel June 14/28; launch Nov. 26/28 est.; deliver Dec. 1/28 est.

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. O. L. Swasey designer. Keel Oct. 15/28 est.; launch Apr. 10/29 est.; deliver May 1/29 est.

Not named, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 260"x35"x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250'x42'x15 ft.; Westinghouse, for Detroit & Windsor Ferry Co.; 156 house, turbines and motors; 3000 S.H.P.; launched May 19/28; deliver Aug. /28 est.

Tahoe No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, hull 1418, steel passenger and freight steamship for the Pennsylvania Railroad Co., West Philadelphia; 300 ft. length, TE eng.

Not named, hull 1419, single-screw coal collier for Berwind-White Coal Mine Co., 1 Broadway, New York; Theo. E. Ferris, designer; 350 L.B.P.; 50 beam; 23'6" draft; 10,020 tons displacement at 25'3" draft; 10 1/2 knots speed; Hoover, Owens, Rentschler recip. st. eng.; 2200 S.H.P.; 2 Scotch boilers.

Not named, hull 1420, sister to above; Bethlehem-Curtis turbines; 1700 S.H.P.; 2 W.T. boilers.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Whim III, hull 2905, commuter boat for Harrison Williams; 56 ft. length; 2-650 H.P. Wright Typoon engs.; delivered in Aug.; speed 54 mi.

Hull 2921, 106-ft. cruiser for L. M. Wainwright, Indianapolis; 2 Speedway diesels, 300 H.P. ea. at 700 r.p.m., wt. 7500 lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan, Detroit, Mich.; 2 170-H.P. Speedway engs.; deliver May/29 est.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

* Purchasing Agent: W.E. Whitehouse.

Elto, hull 128, wood yacht for T. A. Yawkey, New York; 56'x11'x3'; 26 mi. speed; 35 D.W.T.; 400 I.H.P. gas engs.; keel May 1/28; launch Aug. 20/28 est.; deliver Sept. 15/28 est.

Not named, hull 130, wood yacht for C. A. Caryell, Bay City; 90 L.B.P.; 17 beam; 4 loaded draft; 12 mi. loaded speed; 75 D.W.T.; 200 I.H.P. diesel eng.; keel June 20/28; launch August 15/28 est.; deliver Nov. 1/28 est.

Not named, hull 131, steel yacht; owner not named; 105 L.B.P.; 17 beam; 6 loaded draft; 14 mil. loaded speed; 110 D.W.T.; 250 H.P. diesel eng.; keel Aug. 1/28 est.; launch Nov. 1/28 est.; deliver June 1/29 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for stock; 125'26" x 26'6" x 5'6".

Hulls 691-694 inc. four steel carfloats for New York Central Railroad Co.; 270'x38'x10'5"; 850 gro. tons ea.

Hull 705, mixer boat for Contract Dept.; 91'x40'x6'3"; 150 gro. tons ea.

Hulls 721-723, 3 standard steel barges for stock; 130'x30'x7'6"; 250 gr. tons ea.

Hulls 729-733, four standard steel barges for stock; 100'x26'x6'6"; 135 gr. tons ea.

Hull 734, steel hull derrick barge for Merritt, Chapman & Scott, Corp.; 116 x 43 x 12 ft.

Hull 735-38 inc., four steel barges for Keystone Sand and Supply Co., 135 x 27 x 8 ft.

Hulls 739-740, two steel snag barges for U.S. Engineers, Memphis; 84 x 24 x 3'6". Hull 741, oil barge for Atlantic, Gulf & Pacific Co.; 80 x 30 x 8 ft.

Hulls 742-3, two steel derrick barges for Atlantic, Gulf & Pacific Co.; 60'x30'x6 ft. Hulls 744-752 inc., 9 steel hopper barges for Union Barge Line Corp., Pittsburgh. 175'x26'x11 ft.

Hulls 753-784 inc., 32 standard Mississippi River Comm. barges for Memphis office.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 104, oil barge for Oil Transfer Corp., 175'x35'x12'5".

Hull 105, oil barge for above; 146'x34'8" x 10'2 1/4".

Hull 106, lighter hull for J. W. Sullivan Co.; 121'x32'6" x 13'4 1/2".

HOWARD SHIPYARDS & DOCK COMPANY, Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hulls 1644-5 inc., two barges for U. S. Engineers, Huntington, West Va.; 80'x26'x5 ft., keels June 25 and 28/28; launched Aug. 13 and 21/28; delivered Sept. 1/28.

Hull 1646, barge for U. S. Engineers, Huntington, West Va.; 80'x18'x4'6"; keel July 14/28; launched Aug. 25/28; delivered Sept. 1/28.

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Hulls 1647-1655 inc., nine steel needle flats for U. S. Engineers, Louisville, Ky.; 40x14x3'6"; 4 keels laid Aug. 7/28.

Hulls 1656-7, two barges for Mississippi River Comm., New Orleans, 120x30x7'6".

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co. 156 L.B.P.; 43 beam; 10 ft. draft ast; keel Aug. 30/28.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Twenty steel hoppers cargo barges for Magdalena River, Colombia; 125x26x6 ft.; 15 delivered.

Stern wheel towboat for South America; 170'x42'x5'; launched.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tandem comp. eng. 14"x28"x84"; keel July 18/28.

Hull 235, sister to above; keel Aug. 1/28.

MIDLAND BARGE COMPANY

Midland, Pa.

C. G. Slider, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x5ft. 6in.; steam tandem comp. eng. 14"x28"x7'0" stroke; keel March 1/28; launched June 23/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x34'x6'6"; keels laid.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6".

One steel barge for P. M. Adema, Pointe a la Hache, La.; 120'x36'x6 ft.

Four dump scows for Div. of Canals and Waterways, State of New York; 100'x28'x7'6"; keels laid.

Six deck scows for Div. of Canals and Waterways, State of New York; 75'x25'x5'6"; 4 launched.

Forty discharge pontoons for U. S. Engineers, Rock Island, Ill.; 38'x14'x3'; 20 keels laid; 16 launched.

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7".

One barge for Heckin Can Co., Cincinnati, Ohio; 125'x25'x4 ft.; keel laid; deliver Sept. /28 est.

Three fuel barges for Union Barge Line Corp., Pittsburgh; 100'x24'x8 ft.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Cathrine D. hull 146, diesel towboat for N. B. Co.; 74 L.B.P.; 18 beam; 4 loaded draft; 150 I.H.P. diesel engs.; keel May 15/28; launched Aug. 10/28; delivered Sept. 1/28.

Hull 149, towboat for Standard Unit Nav. Co.; 92'x24'x5 ft.; keel May 10/28; launch Jan. 1/29 est.

Hull 154, deck barge for stock; 120 L.B.P.; 30 beam; 7 loaded draft; keel July 5/28; launched July 27/28; delivered Aug. 14/28.

Hull 155, same as above; keel July 12/28; launched July 27/28; delivered Aug. 14/28.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft; keels laid Aug. 22 (2); Aug. 27 (2). Sept. 6/28 est.

Hull 161, ferry hull for stock; 150 L.B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28 est.

Hull 162, deck barge for stock; 160 x 32 x 7 ft.; keel Sept. 25/28 est.

Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft; keel Sept. 25/28 est.

Hull 164, deck barge for stock; 120x30'x7 ft.; keel Sept. 28/28 est.

Hull 165, same as above; keel Oct. 10/28 est.

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28 est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy, 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launched Aug. 18/28.

Not named, hull 329, sister to above; keel Oct. 15/28 est.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr., 272'11" L.O.A.; 36'6 3/4" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 12/28; launch Nov./28 est.; deliver Apr. /29 est.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; keels July 12/28; launched Oct. 5/28 est.; delivered Oct. 5/28.

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WILMINGTON, CALIF.

Not named, hull 1038, twin screw diesel yacht, on Arctice E. Wheeler, New York 126 L.O.A., 21'6" beam, 8'6" app loaded draft; 2 250-B.H.P. diesel engs.; deliver April 18/29 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.
General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 99' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. engs.; keel July 13/27; launched June 16/28.

Not named, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28.

SPEEDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison

Not named, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launch Oct. 15/28 est.; deliver Dec. 1/28 est.

STATEN ISLAND SHIPBUILDING CO., Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28

SUN SHIPBUILDING COMPANY Chester, Penn.

Purchasing Agent: H. W. Scott.

Hull 114, carfloat for Reading Railroad; 200x34x7'9"; keel June 15/28; launched and delivered Aug. 9/28.

Hull 115, same as above; keel June 29/28 launched and delivered Aug. 16/28.

TOLEDO SHIPBUILDING CO. Toledo, Ohio

Purchasing Agent: Otto Hall.

Hull 179, dump scow for Central Dredging Co.; 144 x 42 ft.

Hull 180, same as above.

THE CHARLES WARD ENGINEERING WORKS Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Incor, hull 70, twin screw towboat for International Cement Corp., New York; 126x26x7 ft.; 2 Fairbanks-Morse 360 H.P. diesel engs.; keel May 18/28; launched July 17/28; delivered Aug. 19/28.

Hulls 71-72, two steel maneuver boats for U. S. Engineers Office, Pittsburgh; 60 x 22x4 ft.; keels laid June 19/28 and July 9/28

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'x7'7 1/2"; 190 B.H.P. Winton diesel eng.

Hull 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army Engineers; 127'x30'x4'4"

Hulls 75-76, two stern-wheel towboats for stock; 64'9"x18'x45"; diesel eng.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant

Dock, clean, paint: m.s. Spinarger. Dock, clean, paint, misc. repairs: Geo. H. Johns, m.s. Gish, Svejnar, Frank G. Drum, schr. Alvarado, District of Columbia, Lio, Idaho. Bandon, San Juan, Tacoma, S. C. T. Dodd, Petaluma, Frank D. Stout, J. B. Stetson, Robert E. Hopkins. Make and install one steel stairway: City of Los Angeles. Pipe repairs: Los Alamos, Cathwood, Mojave. Tail shaft repairs. Oleum, Mericos H. Whittier, schr. Bandon (also propeller repairs), Hart Wood Lumber Co. Turbine repairs: President Wilson, H. F. Alexander. One gun metal stern bearing bushing: Emido. Conveyor repairs: Manchuria. Lower section stern frame: West Isip. Make and furnish 300 tube retarders: H. W. Baxter. Misc. repairs: Dilworth, Cedarhurst, Los Angeles, Scottish Castle, M. F. Elliott, Manchuria, Argyle, Winifred O'Donnell, La Placencia, schr. Samoa, Altair, Calmar, Satanta, Sommerstad, Varanger, La Brea, Makura, San Jose, Corsicana, Diamond Head, Point Montara, Benjamin Franklin, Willsoil, Limon, Point Sur, San Mateo, tug F. A. Doust, strmr. Esparta, Mongolia, Jalisco, Caspar, Hoquiam, Solano.

CHARLESTON DRYDOCK & MACHINERY CO., Charleston, West Va.

Misc. repairs: strmr. West Wauna, schr. Mary H. Diebold, tugs Waban, Cecia.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Purchasing Agent: E. Podmore.

Side damage repairs: strmr. J. Frater Taylor (also bottom damage repairs), Godrich (also new hub installed and stern bearing relined). Hull repairs and caulked: barge Davidson. New wheel mounted: m.s. Hibou.

CRAIG SHIPBUILDING CO., Long Beach, Calif.

Miscellaneous repairs to: m.s. Alessandro, Flying Cloud, A. B. Carpenter, yachts Gloria Dalton, Aimee, dredge Los Angeles.

PRINCE RUPERT DRYDOCK & SHIPYARD.

Prince Rupert, B.C.

Misc. repairs: Canadian Rover. Docked, cleaned, painted, misc. hull and engine repairs: 13 fishing boats. Misc. hull and engine repairs to 35 fishing boats not requiring docking.

TODD DRY DOCKS, INC., Harbor Island, Seattle

Drydock, paint, misc. repairs: Admiral Rodmon, Nizina (also draw tail shaft for examination). S. A. Perkins, Perry L. Smithers, G. B. Petroleum II. Fire damage repairs: Curacao, General overhauling: Edmore, Eleridge. Damage repairs to hull, m.s. Grossholm. Misc. and voyage repairs: Childar m.s. Dinteldyk, H. F. Alexander, President Jackson, Suwid, West Montop, Olympic, President Grant, tugs Tyee and Vigilant.

U. S. NAVY YARD, Bremerton, Wash.

Drydock and misc. repairs: California, Tennessee, McCauley, Farragut, Doyen, Kennedy. Misc. repairs: West Virginia, Omaha, Lexington. Misc. repairs incident to operation as district craft: Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.



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when they specify lubricants or fuel or diesel oils.

More often than not they'll insist on Shell products. In the first place, Shell is always available—at the nearest port or the most remote. And, too, Shell products are dependable, standardized, proven. No use to handicap oneself with untried oils when there are reputations at stake!

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Who did What - - and How



When the Westfal-Larsen Company motorship *Brandanger* docked in San Francisco, Chief Engineer F. Sorlia came ashore with a lot of

praise for the way his ship performed on its most recent trip. The 11,400 ton *Brandanger* is one of a fleet of eight motorships operated by Westfal-Larsen Company. It is powered by a 2,800 horsepower B. & W. trunk piston type motor with electric driven auxiliary, and makes an average speed of twelve knots.

Chief Engineer Sorlia has been with this vessel for two years. "We used Shell diesel cylinder oil and Shell diesel fuel oil all the way," said Mr. Sorlia. "And not a sign of trouble—in fact we used less fuel and lubricant than our rated consumption, even with a fair share of rough weather and a big cargo."

S.S. Tashmoo, Chas. Nelson Steamship Company boat, docked at the new Encinal wharf in Alameda September 1st and put in a call for Shell Turbine Oil. Her tanks were filled in forty minutes, the gear cleared away and a full day left for work on the cargo.

The *Tashmoo's* C. E., T. Bonner, reports perfect results from Shell Turbine Oil and perfect service on Shell deliveries.

Twenty-five years ago the British Parliament debated for many days the question of allowing tank steamers to pass through Suez Canal loaded with Kerosene. Gasoline tankers transit both Suez and Panama today, of course, without the slightest question.

The "*Aquitania*," the second largest vessel in the Cunard Fleet, was filled with 14,000 gallons of Shell Turbine Oil when launched in 1913, and the system has never since been completely cleaned out. Shell en-

gineers made an inspection of this vessel a few weeks ago and found the bearings of the turbines to be in perfect condition.

The Dollar Liner *S.S. President Hayes* arrived in San Francisco early in September and left port three days later on another round the world voyage.

Ship's officers reported a very fine trip with fair weather and comfortable warmth. According to J. S. Patterson, the President Hayes' Chief Engineer, the ship made a remarkable record in the engine room, particularly with touchy crank pin bearings, apt to burn out heretofore.

Mr. Patterson is inclined to divide the credit. "Good oil is mighty poor lubricant in the can. You have to get it on the bearings, and that means good oilers. We have good oilers all right and use Shell lubricants. Taken together they make a fine working combination."



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

A FLAT increase of 25 per cent, effective August 1, in the rates to and from Nicaragua, port of Corinto, on all freight has been agreed upon by all steamship line members of the conference. This applies to all freight consigned to Corinto from foreign ports as well as on freight received at Corinto for other ports. High port charges are the reason for the big increase. These port charges are so heavy as to jeopardize earnings. Previous to January 1, vessels calling regularly at Corinto had been exempt from all port charges, in return for which exemption they had carried the Nicaraguan mails free of charge. It is claimed that earnings from the mails are much less than the port dues, so that net expenses at the port are much higher.

Los Angeles Steamship Company will spend the sum of \$75,000 on remodeling and redecorating certain of the public saloons and state-rooms of the liner City of Los Angeles. With the constant progress noted in shipbuilding and designing, R. J. Chandler, vice-president and general manager of the Lasso Line, announces that the innovations to be made this fall are such as will incorporate the most recent refinements of decoration and furnishing as applied to passenger steamships.

When the vessel sails on October 6 for a special 64-day de luxe cruise around South and Central America, she will have been entirely refloored on the main deck and stairs, the finest grade of rubber tiling in attractive designs replacing the old flooring. The job of refinishing the staterooms in lacquer will be completed upon her return from Honolulu this month. Seals of Hawaii, California, and the United States will be cut in colors into the new windows.

To adjust claims of Japanese shippers that are pending against the United States Shipping Board, Commissioner **Albert H. Denton** is now in the Far East.

The claims are of long standing,

and it was decided to send Commissioner Denton to Japan to effect settlement. The amounts involved were not divulged. The claims resulted from damage to merchandise. Commissioner Denton will also inspect Shipping Board offices in the Far East during his trip.

S. J. Nathan, president of the Maritime Inspecting and Forwarding Company, is on the Coast making a survey looking toward the advisability of opening offices in San Francisco and Los Angeles.

The seventh annual convention of American Association of Port Authorities to be held in Houston, November 12 to 14, will be attended by shipping leaders from all parts of the United States and Canada.

G. B. Hegardt, chief engineer and

manager of the port of Oakland, is president of the body.

Winfield M. Thompson, field agent for the Panama Pacific Line, will make the round-the-world cruise aboard the I.M.M. liner Belgenland. Thompson has been making his headquarters on the Pacific Coast for the past six months, but recently left for New York to join the Belgenland. He will direct publicity during her globe-circling trip.

Harry Dorman, traffic manager for the McCormick Steamship Line at Portland for the last several years, has resigned. He plans to enter other work.

While **Paul Taube** remains ashore for several trips, **John Penberthy** is acting chief engineer aboard the carrier Golden State of the Oceanic and Oriental Navigation Co. fleet.



Pacific Coast Manager G. Harold Porter of the Radio Corporation of America presenting to Wireless Operator Joseph T. Crony the Radio Corporation medal and check for meritorious service when the American steamship Indiana Harbor was wrecked north of San Francisco, May 18, 1927.

McCormick Service Covers 80,000 Miles



WITH Pacific Coast commerce rapidly developing greater volume, the McCormick Steamship Company is keeping pace with service requirements of shippers and consignees. Today our patrons are served with five distinct fleets: Coastwise, Intercoastal (Munson-McCormick), East Coast of South America (Pacific-Argentine-Brazil Line), Gulf-East and West Bound (Redwood Line), Pacific-Porto Rican Service (Munson-McCormick).

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COLOMBIA SERVICE

From San Francisco—Los Angeles

*S.S. Guatemala.....	Oct. 11	Oct. 13
†M.S. City of S.F.	Oct. 18	Oct. 20
*S.S. Colombia	Nov. 8	Nov. 10
†S.S. Corinto.....	Nov. 15	
*S.S. Ecuador	Nov. 22	Nov. 24

From New York—Cristobal

*S.S. Ecuador.....	Oct. 18	Oct. 28
†M.S. City of Panama...		Oct. 29
*S.S. Venezuela.....	Nov. 1	Nov. 11
*S.S. Guatemala.....	Nov. 15	Nov. 25
†M.S. City of S.F.		Nov. 26

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York.

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George W. Simmons is acting first assistant engineer aboard the Matson steamer Lurline while Harry P. Peterson is on a vacation.

Kenneth D. Dawson, president of the States Steamship Company and the Columbia Shipping Company, Portland, is now a director of the Associated Oil Company of California.

Advices received in San Francisco tell of the selection of Edward S. Butler, president of the Canal Bank & Trust Co., as president of the board of port commissioners at New Orleans. He assumes the post vacated by R. S. Hecht.

A twin-screw motor liner has been ordered in England for service of the Furness Pacific Coast-United Kingdom run. The vessel is to be of 10,000 tons deadweight with a length of 451 feet. Her speed calls for 13 knots and plans include 75,000 cubic feet for refrigeration. The craft will replace the London Importer.

The lumber carrier Horace X. Baxter, idle for more than a month during a lull in the lumber mart, is again carrying. Peter Madison is chief engineer, Frederick Weiss first, and Anton G. Jaeger, second.

William Muir, inspector with the Marine Department of the Standard Oil Company of California, is at present on business in Germany, where his company has a diesel tanker under construction.

Howard Burget, former district passenger and freight agent in Los Angeles for the Matson Navigation Company, has been transferred to the San Francisco office, it was announced. Burget was in Los Angeles for seven years.

Charles F. Tait has been elected vice-president of the International Stevedoring Company in Seattle, according to a statement issued by Gerald Fitzgerald, president of the firm. Tait will be in charge of the entire northwest territory with Fred Tuttle, general manager.

Kenneth Dame left Los Angeles, where he was assistant to the district manager of the Bureau of Foreign and Domestic Commerce, for Indianapolis, where he will take over the management of the Department of Commerce bureau.



Leo E. Archer, popular Pacific Coast passenger traffic manager for the Panama Pacific Line.

The Great Southern Redwood Company purchased the five lumber carriers, comprising the fleet of the Finkbine Guild Corporation. These vessels have been operated for the last two years between Pacific Coast ports and the Gulf. The vessels involved in the sale include the Manhattan Island, Dio, Dohet, Sabotawan, and the Abron.

The report stated that the McCormick Steamship Company would continue as Pacific Coast agents for the concern, which is known as the Redwood Line.

Next month the steamer Stanford, building in Norwegian yards for the Latin-America Line, will be ready for service. The vessel will make a total of five ships operated from San Francisco to Central and South America.

This interesting sketch of a sailing ship at sea was drawn by "Bob" Craig, 17-year-old high school student of San Francisco and son of W. G. Craig, lubricating oil expert of the General Petroleum Corporation.



The Stanford, 8600 deadweight tons, will have 17,000 cubic feet of refrigeration, and will also have accommodations for a limited number of passengers. The other vessels are the Regulus, Childer, Romulus, and the Horda.

Promotion of Perry S. Newcombe as manager of the Los Angeles office of Dodwell & Company was announced by officials of the company. The report said that in the future dealings will be carried out directly with the Vancouver office of the company instead of San Francisco, as has been the practice in the past.

Newcombe was formerly assistant manager for Dodwell & Company at San Francisco.

The ranks of the old-time sailing ship masters who blazed a trail of glory in the commerce marts of the seven seas on fast clipper ships was further depleted with the passing of Captain George G. Wester, veteran Pacific Coast skipper.

Captain Wester passed away at his home in Oakland. He had been master of the famed bark Pactolus and bark Kate G. Pedersen. He also engaged in seal hunting in the North for many years.

Rivalry of steamship companies throughout the world in the construction of mammoth liners is again assuming gigantic proportions.

The liners Europa and Bremen for the Atlantic service of the North German Lloyd were launched recently at German yards. Each vessel is of 46,500 gross tonnage, and is 938 feet over-all. The North German Lloyd hopes to capture the

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speed prize of the North Atlantic with these vessels.

Close upon this launching comes the news that the White Star Line had under construction a "supreme liner" at Belfast yards. The giant carrier will be used between Southampton and New York, and will be of 60,000 gross tons. She will be christened the Oceanic. This vessel will be the largest vessel in the world, and will cost \$30,000,000.

From London reports it would seem that officials of the Cunard Line plan to construct a liner as large as the Oceanic for its North Atlantic ferry.

Claude Lombard, shipping master of the Ship Owners' Association of the Pacific, widely known in shipping and rail circles on the Pacific, was buried recently. Death culminated an illness of several months. Lombard has been director for crew personnel of the lines under the Association. Prior to joining the sea service bureau he was connected with the water lines of the Northwestern Pacific Railroad. He was actively associated with shipping for more than thirty-five years.

Customs collections for the Port of San Francisco for the month of August amounted to \$1,059,434.87, according to a statement issued by Collector W. B. Hamilton. This amount increases the total collections for the eight months of the current year to \$8,726,715.02 against \$8,683,664.82 for the corresponding period of 1927.

During the month of August, 670 vessels of a net tonnage of 1,619,175 arrived in San Francisco, according to figures supplied by the Marine Department of the Chamber of Commerce. The number of departures from the port for the same period gave an aggregate net tonnage of 1,665,325. Both arrivals and departures for the month indicated an increased tonnage over corresponding periods last year.

The Seattle office of Norton, Lilly & Company is now on the twenty-eighth floor of the L. C. Smith building. It was formerly in the Alaska building.

The British Board of Trade is taking steps to gather information which will lead to the abandonment of the practice of overloading ships. The board aims to place idle ships in service to handle surplus cargo, which, it holds, will lead to the em-



Captain Walter J. Pringle, 30 years of age and recently appointed master of the motorship City of San Francisco. He is the youngest ship executive in the Panama Mail Steamship Company service.

ployment of large numbers of unemployed seamen and officers. The board has asked information of ship owners relative to overloading and appeals for their support and guidance in the proposed campaign to abolish the evil.

Captain William Anderson, former head of the United Fruit Company fleet, died recently at the Trumbull Hospital in Boston. Captain Anderson, in a period of twenty years service with the company, superintended the building and operation of the ships which have become known as the "Great White Fleet." He retired in 1920.

Norman F. Titus, former San Francisco shipping man and now head of the transportation division of the United States Bureau of Foreign and Domestic Commerce, is expected in San Francisco October 20. The visit will be the first since Titus was appointed to his present position by Secretary Hoover. He will address the annual banquet of the Pacific Traffic Association on the day of his arrival, according to announcement.

The Extension Division of the University of California arranged for three courses of interest to shippers at San Francisco starting in September. These included lectures on Construction, Nomenclature, and Progress in Marine Engineering by Professor C. F. Gross; "Modern Export Organization" and on "Problems Peculiar to South American Trade"; the latter two provided by Ralph Scanlan, instructor in Foreign Trade and Economics at the Marin Junior College.

H. C. Brown, former district freight agent at Philadelphia for the Munson Line, is now with the Nelson Line operating intercoastal service from Baltimore, Norfolk, and Savannah to the Pacific ports.

San Francisco shipping men mourn the loss of Captain Wilhelm Mueller, commander of the Hamburg-American liner Reliance, who passed away recently while his vessel was a few miles out of New York Harbor. Captain Mueller was a veteran master on commercial vessels and also served as com-



Deck officers of the Matson Navigation Company's liner Malolo, first vessel on the Pacific to enter United States Naval Reserve with the required 50 per cent of deck and engine departments signed up. Left to right, the above group shows: David Bowman, Fourth Officer; T. K. Whitelaw, First Officer; Captain C. A. Berndtson; and H. C. Dyer, Chief Officer.

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manding officer of a cruiser in the German navy. He was buried in Hamburg.

Refrigeration will be installed in the West Coast steamers of W. R. Grace & Co., Fred Doelker, traffic manager, announces. He added that the first installation would be on the Cuzco and pending space demand on that vessel, similar refrigeration facilities would be carried out on other steamers of the company.

Captain Theodore G. Lewton, United States Coast Guard, has assumed the post of chief engineer of the California division. He succeeds Captain John E. Dorry, retired September 26. Captain Lewton is well known on the Pacific Coast.

J. C. Stubbs, traffic expert, is now with the American-Hawaiian Steamship Company. Stubbs has been with the Southern Pacific Company and Spreckels interests handling traffic.

The Matson Oceanic Steamship Line has been awarded the contract for carrying mail between San Francisco and Sydney, Australia. The contract is to run ten years with compensation based on the maximum rates under the Jones-White Merchant Marine Act.

Pacific Coast shipping interests are taking active part in plans for the erection of the Navy and Marine Memorial to be erected in Washington, D.C. Secretary of the Navy Curtis D. Wilbur, Secretary of War Davis, and other members of the cabinet are on this Honorary National Committee. Among Pacific Coast contributors to the fund for the establishment of the maritime monument are Dollar Steamship Company, Isthmian Line, Alaska Steamship Co., Argonaut Steamship Co., Norton, Lilly & Company, and the Nippon Yusen Kaisha.

Captain J. Duchesne, well-known master along Coast ports, has been named commander of the new liner Oregon of the French Line, according to Captain B. Aillet. Captain Duchesne has been master of the freighter Notre Dame de Fouvriere. Captain L. Thoreau, at present master of the freighter Alaska, has been chosen skipper of the Wyoming; while Captain J. Greffier will transfer command from the Maryland to the Wisconsin.

The French Line announces a combination freight and passenger

service between Martinique, St. Barthelemy, and the south coast of Haiti. The service to be operated monthly with the possibility of more frequent service is conditions justify. The Aveyron, recently purchased by the line, is to be the first vessel on the run. The service will make connections at Martinique for the company's passenger and freight service from the Panama Canal to Europe.

Evan C. Evans, founder of the shipping firm of E. C. Evans & Sons, San Francisco, passed away in San Rafael recently following an operation. The veteran steamship operator was associated with his sons Evan C., Harry L., and Arthur C. Evans in the firm. He came to San Francisco in 1878 and was named representative for Dewar & Webb. The Evans firm was incorporated in 1909.

The Dyson Shipping Company has been named as agent on the Pacific Coast for the London, Midland &



H. G. Thurston, manager at Salvador for W. R. Grace & Co.

Scottish Railway. The railroad is one of the largest transportation systems in Great Britain.

Plans for the centralization and stabilization of action and rates for transportation of passengers to and from Pacific Coast Canadian and United States ports and the Far East made by the Transpacific Passenger Conference have received approval of the United States Shipping Board. The agreement fixes the commissions to be paid agents, rates and conditions governing transportation, and prohibits

absorptions of port-to-port fares, locally, except between Seattle, Vancouver, and Victoria in connection with third-class Asiatic passengers.

The collection of name boards of old steamers that plied the Columbia, Snake, and Willamette Rivers is the hobby of Captain Arthur Riggs, who has already procured quite a number. Riggs is in communication with persons in many Pacific Coast ports ranging from San Francisco to Dutch Harbor in an effort to round up the remaining relics of once famous craft. The collection, when completed, is to be placed in the memorial building at Champoug Park on the Willamette river, about 30 miles south of Portland. One plate that he is anxious to obtain is that of the Eliza Anderson, wrecked on the beach of Dutch Harbor in 1897 after taking Alaskan prospectors 1400 miles up the coast from Seattle.

Opposition to the specifications of the proposed San Francisco Bay bridge between Rincon Hill and Alameda is registered by the Pacific American Steamship Association in a recent communication to the San Francisco city engineer. Reviewing the history of its position in regard to the projected span, and clarifying various points at issue, the association asks a hearing in order that its attitude may not be misunderstood or misrepresented.

Following a three months' stay abroad, where he studied conditions at first hand, Captain B. Aillet, Pacific Coast manager of the Compagnie Generale Transatlantique (French Line), is back at his San Francisco headquarters. In regard to the Pacific Coast-European trade, Captain Aillet pointed to the French Line's confidence shown by its extensive building program. Four 15,000-ton combination freight and passenger liners of 16 knots speed are being turned out for the Pacific Coast-European service. The first of these, the Oregon, will make her first appearance at San Francisco April 2, 1929. She will be followed by the Wyoming and Wisconsin and a fourth craft yet to be named.

For twenty-seven years manager of the British Columbia coast steamship service of the Canadian Pacific Railway at Victoria, Captain James W. Troup has just announced his retirement from active service.

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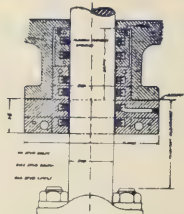
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NORTHWESTERN	3,094	DERBLAY	3,474
CORDOVA	2,273	DENALI	3,474
LAKINA	2,273	NABESNA	2,451
LATOCHE	2,332	KETCHIKAN	2,373
		Total	50,843

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This brings to an end one of the most picturesque careers of a Pacific Coast navigator. Captain Troup will be succeeded by Captain Cyril D. Neroutsos, assistant manager.

Captain Troup is now in his 73rd year and has seen 56 years of continuous maritime service on the Pacific and during his services with the Canadian Pacific Railway has been connected with the design and construction of about forty vessels of various types.

Friends hailed with delight the recent announcement of the promotion of Frank W. Windley, assistant general freight agent at Los Angeles for the Nelson Steamship Line, to the post of district manager at Seattle in charge of the Northwest territory and the advancement of Carl D. Rogers, contracting agent at Los Angeles to succeed Windley.

A number of well known masters of the Royal Mail Steam Packet Company who have sailed in and out of Pacific Coast ports for years were recently promoted by officials in London. Captain E. G. Wakeman has been made master of the Asturias, one of the largest passenger motor vessels in the world; Captain G. F. Huff now commands the passenger liner Arcadian; the steamer Araguaya is under command of Captain Shillitoe; Captain J. Green has the steamer Desna; Captain T. C. L. Buret has the steamer Desado; Captain Purvis commands the steamer Glamorganshire; Captain F. R. Miles the steamer Niagara; and Captain A. G. Miles the steamer Natia.

T. A. Lee & Holway is a new agency firm just organized in San Francisco by these two former officials of the Furness (Pacific), Ltd. They will represent a new Pacific Coast-United Kingdom service to be known as the Reardon-Smith Line, Ltd., a Cardiff house that operates in various trades.

Lee, it will be remembered, retired a year ago as Pacific Coast manager of Furness (Pacific), Ltd. Holway has just resigned as traffic manager at San Francisco of the same firm. Lee is succeeded by A. F. Sidebotham, another well known steamship official.

The new service, it is announced, will begin on a monthly basis, with the berthing on the Pacific range of the new motorship East Lynn in October. At the start London and

Liverpool will be the United Kingdom ports of call with the addition of other ports later. The East Lynn is to be followed by the Quebec City and the December ship will be the West Lynn, now being completed on the Clyde.

Pacific Coast shipping circles hailed the Baltimore announcement made recently that Henry Williams had been made president of the Baltimore & Caroline Steamship Company to succeed the late Mason Williams.

Cunard Line will go in for two-class passenger liners next April, when the Cameronia and California are placed on the run between New York and Glasgow under this new system. The vessels are now three class steamers, but will be changed to tourist and third class liners.

With C. C. Nelson in charge, the Oregon Forwarding Company, Inc., Portland, has opened offices in Seattle. The concern, which is headed by C. A. Finger, was organized three years ago.

Only four months in business at Portland, Alexander & Baldwin, agents for the Oceanic & Oriental Line, have already been forced to enlarge their headquarters in order to properly care for expanding business.

Captain J. R. Stewart, R.N.R., and well known Vancouver master, recently celebrated his golden wedding. Captain Stewart has for many years conducted a nautical school at Vancouver, and is best known as

the guide, mentor, and friend of young masters, mates, and coast-wise ship officers.

John G. Patricio, boatswain, United States Coast Guard Service, has retired from active duty after having reached the retirement age. Patricio is known to sailormen, shipping officials, and mariners in all parts of the world, and leaves the service with a record for loyalty, devotion to duty, and efficiency. He was best known as commander of the old coast guard cutter Hartley and the boarding cutter Golden Gate.

After a meritorious service of two and one-half years as district director of the United States Shipping Board, Ralph T. Johns has resigned. Mr. Johns has not announced his plans, but it is understood that he will be identified with the shipping industry in San Francisco, where he held forth for the Board. T. G. Munro of the Shipping Board marine division will serve as acting director pending the complete termination of Shipping Board activities. Robert Gardner, district traffic director, remains at his post until final details are consummated.

Johns was connected with several important shipping activities before entering the government service, and was also in business as a ship broker.

Pilotage conditions on the British Columbia coast are to be investigated by Justice Auley Morrison, who has been vested with the full powers of a royal commissioner



Captain John T. Diggs, master of the Matson liner Maui, had been laid up sick. He is here shown returning from the Islands on the Matsonia to take up his work on the Maui.



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Trade, Traffic, and Shipping

Thirty Years Commerce in Philippines

By Major-General Frank McIntyre

Chief, Bureau of Insular Affairs, U.S. War Department.

BY the treaty of Paris closing the Spanish-American War (framed thirty years ago and ratified in February, 1899), the United States agreed to admit, for a period of 10 years, Spanish ships and merchandise to the Philippine Islands on the same terms as American ships and merchandise. This provision was construed as eliminating any equitable basis for the recommendations of the Philippine Commission that Philippine products be admitted into the United States with a waiver, in whole or in large part, of customs duties.

By act of March 8, 1902, however, Congress ratified the tariff laws enacted by the Philippine Commission, which provided that articles going into the Philippines from the United States should pay the same duty as like articles imported from foreign countries, and that, similarly, shipments into the United States from the Philippine Islands should pay the duties imposed on like articles from foreign countries, except that upon articles grown and produced in the Philippine Archipelago the duty should be only 75 per cent of the rates aforesaid. It was not until 1909, therefore, after the expiration of the ten years, that it was possible to secure the free admission of Philippine products into the United States, and then under limitations that did not encourage rapid development of trade. Finally, in 1913, free admission of Philippine products without limitation on direct shipments was secured.

Favorable Trade Balance Maintained in Recent Years

In the last normal years preceding the Spanish-American War, Philippine total trade was valued at between \$25,000,000 and \$30,000,000 annually. In the first six calendar years following the close of the war, or from 1899 to 1904, inclusive, the average value amount-

ed to \$54,000,000, and owing to disruptions attendant upon local disorder, especially in 1899, the balance of trade was heavily against the islands until the last year of the period. In 1904 the excess of imports was materially reduced, and in the next year gave way to a large export balance. From 1905 to 1909, inclusive, total trade maintained practically the same levels as in the preceding six-year period, averaging \$53,000,000 annually, and a substantially favorable balance accrued each year, the total more than wiping out the former deficits.

For the years of the partial free trade relations, 1909 to 1913, the average value of oversea trade increased to \$100,000,000, but the balance of trade again was turned against the islands, remaining unfavorable until 1914. Since that date, however, foreign trade has rapidly increased, with the relation of exports to imports always favorable, and usually heavily so, except for two years, 1919 and 1921, during the postwar depression. In the eight years 1914 to 1921, inclusive, the annual average of foreign trade rose to \$180,000,000, and in the six years since 1921 it has exceeded \$237,000,000. In the last calendar year total oversea trade was considerably in excess of this average, with exports and imports totaling \$271,400,000.

Profitable Transactions with Foreign Countries in 1927

The annual report of the Bureau of Customs of the Philippine Islands for 1927 shows that notwithstanding a decrease of \$287,500 in customs collections as compared with 1926, the islands enjoyed enviable prosperity in their trade relations with foreign countries—their total trade exceeded that of the preceding year by over \$15,000,000; that the year was second only to the banner year of 1920; and that the progress attained was

brought about by a normal and steady development of the country's resources, uninfluenced by unusual circumstances.

Compared with 1926, export trade, valued at \$155,600,000, registered an increase of \$18,700,000, while import trade declined by \$3,400,000 to \$115,900,000. The decrease, however, was attributable mainly to the considerable falling off in imports of rice which, reflecting as it did an increased home production of the food staple, was an encouraging feature.

Increase in Trade with the United States

Total trade with countries other than the United States in 1927 amounted to \$84,000,000, as against \$84,600,000 for 1926, thus registering a slight falling off which, on the other hand, was more than compensated by the increase in trade with the United States from \$171,600,000 in 1926 to \$187,500,000 in 1927. Philippine trade with the United States amounted to only \$4,650,000 in 1899. Imports from the United States in 1899 were valued at \$1,150,000; in 1927 at \$71,000,000. Philippine exports to the United States in 1899 were worth about \$3,500,000; in 1927 this trade was valued at \$116,040,000.

In a comparison of Philippine commercial development over the period 1899 to 1927 with the advance made in foreign trade of the United States during the same years, it will be seen that the United States' total exports in 1927 were about four times larger than in 1899, while the export trade of the Philippine Islands was about ten times larger, and that imports into the United States in 1927 were approximately six times those of 1899, while the value of Philippine imports was practically nine times that of the earlier year.

—Commercial Reports.



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Forty-five ton concrete floor sections of the new San Francisco Bay Toll Bridge are safely handled by American Steel and Wire Company's Rope used on Haviside Derrick Barge No. 4.

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STEEL AND WIRE COMPANY

Distributed on the Pacific Coast by

UNITED STATES STEEL PRODUCTS CO.

SAN FRANCISCO

LOS ANGELES

PORTLAND

SEATTLE

VANCOUVER, B. C.

PLEASE MENTION PACIFIC MARINE REVIEW

Tokyo Direct

Radio Corporation Makes Great Forward Stride in Transpacific Communications

MORE than ten years back, the Radio Corporation of America established a commercial radio telegraph service from San Francisco to Japan via Honolulu. Inauguration of this service at that time reduced the then existing rates nearly 50 per cent and provided a much faster and better service than had been possible prior to this radio hook-up. During the past ten years the Radio Corporation of America has been continuously and consistently working for the betterment of its transpacific service. In addition to the Japanese service, direct radio service has been established to Hawaii, to the Philippine Islands, to the Dutch East Indies, and to French Indo-China; and more recently to Hong Kong and Shanghai via Manila.

Realizing the necessity for faster and more accurate communication over the Pacific, as demanded by American business, the Radio Corporation of America, after long and expensive experiments, has recently completed a beam radio circuit directed toward Japan which now permits practically instantaneous contact with Tokyo and all of the principal cities of the Japanese Empire. Messages go direct from the operating room at 28 Geary Street, San Francisco, to the central office at Tokyo without relay. From the Tokyo office, direct land lines operate to all of the principal cities in the Japanese islands, Korea, and South Manchuria.

This hook up has been made possible by the cooperation of the Japanese Imperial Department of Communications, the direct service being officially opened September 1, 1928.

In making this service possible, the experience and skill of the engineering organization of the Radio Corporation of America have been given without stint, and large funds have been expended in experimental and in commercial apparatus and construction. In the operating room alone at San Francisco over \$45,000 have been expended during the past three years to produce an operating station second only to that of the Radio Corporation in New York City. The work on this operating room is not



View in the operating room of the Radio Corporation of America at San Francisco where radio messages are transmitted or received direct from Japan, Philippine Islands, Hawaii, Dutch East Indies, and French Indo-China.

yet complete. When finished, it will be the equal of any commercial operating station in the United States, save only in point of size.

The transpacific transmitting station in Marin County has been added to as the demands grew and is now to be completely rebuilt according to new plans being prepared by San Francisco architects.

Commercial radio communication has had such rapid growth during the past ten years as to appear almost miraculous. It is now more than holding its own in competition with cable service and undoubtedly with its further perfection and dependableness, will replace the expensive installation of submarine cables.

Freights, Charters, Sales

September 12, 1928.

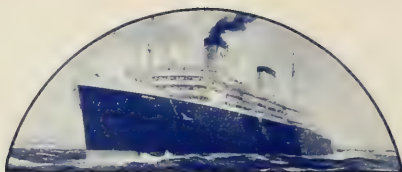
THE following steamers are reported fixed with wheat from North Pacific to the U.K.-Continent: British str. Koranton, 27/, Sept.; Japanese str. . . . Maru, 28/, Sept.; British m.s. Vinemoor, 28/9, Sept., L. Dreyfus & Co.; a steamer, 29/6, Dec., Continental Grain Co.; British str. 28/9, Sept./Oct., Balfour Guthrie & Co.; Japanese str., 30/3, Oct., Wm. H. Pim, Jr. Co.; Japanese str. . . . Maru, 29/, Sept./Oct.; British m.s. Westmoor, 29/, Sept., Kerr Gifford & Co.; a steamer, 29/6, Jan., Continental Grain Co.; a steamer, same, Feb.; a steamer, 30/, Nov.; Japanese str. Aden Maru, 31/, Sept.; British str. Ben . . . 30/, Oct.; British m.s. King John, 28/9, Sept., L. Dreyfus & Co.; British str. Hazelside, 30/6, Oct.,

Earl Stoddard; British str. Swainby, Sept., Kerr, Gifford and Co.; a steamer, 30/., October, L. Dreyfus & Co.; a Roper str., 29/., Dec., same charterers; British str. Homeside, 30/6, with options 31/9; Nov., L. Dreyfus & Co.; a Smith str., 29/., with options 28/6, Oct./Nov., Canadian Cooperative Wheat Producers; British str. Gracefield, 29/6, Oct./Nov., same charterers; Japanese str. . . . Maru, 30/., Nov.; British str. Peterton, 30/., Oct.; a steamer, 29/6, Jan., Continental Grain Co.; British str. Bradburn, 30/., Oct., Kerr, Gifford & Co.; British str. Orient City, Oct., Longview Grain Elevator Co.; British str. Hesleyside, 30/6, Nov.; Japanese str. . . . Maru, 28/3, Oct.; Norwegian str., 29/., Nov., Canadian Cooperative Wheat Producers Assoc.; British

These distinctive ships are completely equipped by RCA



RCA Radio Direction Finder



S. S. Malolo, Matson Navigation Company



S. S. Yarmouth, Eastern S. S. Lines



M. S. Santa Maria, Grace Line

The Radiomarine Corporation of America now furnishes radio service to more than 1300 American vessels. More than 800 vessels of 120 steamship companies now carry either receivers, transmitters, or radio direction finders furnished by RCA.

Radiomarine storerooms and service stations in charge of radio men of long experience are located at the following ports:

Boston
New York
Philadelphia
Baltimore
Norfolk

New Orleans
Port Arthur
Galveston
Los Angeles
San Francisco
Seattle

Honolulu
Cleveland
Chicago
Buffalo
Duluth

Complete RCA Service includes:

1. **Equipment**—transmitting and receiving, vacuum tube type; radio direction finder.
2. **Service on Equipment**—regular inspections at any of sixteen ports; maintenance of conveniently located stocks of spare parts for repairs and renewals.
3. **Operators**—detailing of experienced operator personnel to the ship.
4. **Coastal Stations**—maintenance of thirteen coastal stations on the Atlantic, Pacific, Gulf and Lakes, for prompt, efficient handling of radio traffic.
5. **Accounting**—checking and settling of accounts.
6. **Miscellaneous**—attention to numerous miscellaneous details.

Radiomarine coastal stations are located at the following points:

Chatham, Mass.
New London, Conn.
East Moriches, L. I.
New York, N. Y.
Buffalo, N. Y.

Tuckerton, N. J.
Baltimore, Md.
(city station)
Galveston, Tex.

Los Angeles, Cal.
San Francisco, Cal.
Chicago, Ill.
Cleveland, Ohio
Duluth, Minn.

RADIOMARINE CORPORATION
OF AMERICA
66 BROAD STREET
NEW YORK

str. Toftwood, 31/3, Nov., same charterers; Swedish str. Sydland, 29/-, Nov., same charterers; a Larinaga str., 30/9, Oct., L. Dreyfus & Co.; Japanese str. Belgium Maru, 29/-, Sept./Oct., Balfour Guthrie & Co.; British str. Kensington Court, Sept./Oct., Bunge North American Grain Corp.; British str. Rio Diamante, 29/-, Sept./Oct., W. L. Comyn & Co.

A fixture is reported from Vancouver to Shanghai, wheat, \$4.25, Oct./Nov. loading, by Canadian Co-operative Wheat Producers Assoc.

The American schr. Dorothy H. Sterling is reported fixed from Columbia River to Australia, Sept. loading, by Pacific Export Lumber Co. and the Norwegian str. Selie from the North Pacific to three

ports Australia, \$12.50, Sept./Oct. loading by J. J. Moore & Co.

The following steamers are reported fixed with lumber to the Orient: Japanese str. Taiho Maru, Columbia River to Yokohama and Moji, Oct., Nagata & Company; Japanese str., North Pacific to Japan, Sept./Oct., Douglas Fir Exploitation & Export Co.; Japanese str. Rozan Maru, Grays Harbor and Columbia River to Japan, Sept., Yamacho & Co.; a steamer, North Pacific to Japan, Oct., Grays Harbor Exportation Co.; Japanese str. Ishin Maru, Columbia River to Japan, Sept., J. W. Allen, Inc.

The British str. Portsea is reported fixed with lumber and wheat from Columbia River and Puget Sound to U. K. - Continent, \$1.30, Oct. loading, by W. L. Comyn & Co.

The British m.s. Mindaro is reported fixed from British Columbia to North Atlantic by Seaboard Lumber Sales Company, and the American str. Onondaga from Puget Sound or Grays Harbor to North of Hatteras, \$14, October loading, by Blanchard Lumber Company.

The Danish m.s. Indien is reported taken on time charter from British Columbia to North of Hatteras, Sept. loading.

The American Tanker Delaware Sun is reported fixed from California to North of Hatteras, 53c, Sept. loading, dirty.

The American schr. Helen B. Sterling is reported sold by the Sterling Steamship Co. to the Pacific Export Lumber Co., terms private.

PAGE BROTHERS, Brokers.



Postwar Trend of World Shipping

(Continued from Page 449)

together totaled 17,323,000 metric tons. This amount was less by 1,633,000 tons, or 8½ per cent, than that in the corresponding period of 1927. Goods discharged aggregated 12,595,000 tons and represented a decrease of 1,875,000 tons, or 13 per cent. Goods loaded totaled 4,728,000 tons—an increase of 241,000 tons, or 5 per cent.

Netherlands. Goods discharged and loaded at ports in the Netherlands (including the trade of that country and the trade of other countries in transit) together totaled 39,045,000 metric tons during the first five months of 1928. This amount was less by 2,208,000 tons, or 5 per cent, than that in the first five months of 1927. Goods loaded were less by 1,247,000 tons, or 7 per cent, and goods discharged were less by 961,000 tons, or 4 per cent.

Denmark. Goods discharged and loaded at Danish ports together totaled 4,064,000 metric tons in the first quarter of 1928—an increase of 219,000 tons, or 5 per cent, over the first quarter of 1927. Goods discharged were greater by 141,000 tons, or nearly 5 per cent, and goods loaded were greater by 78,000 tons, or about 8 per cent.

British Isles. Tonnage figures of the total oversea

trade of the British Isles are not compiled. However, the British Board of Trade publishes index numbers of changes in the volume of trade, determined from comparison of changes in prices. These index numbers for the first half of 1928 and 1927 are shown below.

Index of Volume of Trade of the British Isles, January-June (Based on 1924 as 100)

Period	Total Imports	Re-Exports	Net Imports	Exports of United Kingdom Goods
1927:				
January-March	118.3	95.2	121.2	98.0
April-June	108.3	102.9	109.0	99.0
1928:				
January-March	109.3	94.5	111.2	105.4
April-June	106.6	98.2	107.7	101.4

Panama Canal. Goods shipped through the Panama Canal, exclusive of petroleum, totaled 12,252,000 long tons in the first half of 1928—an increase of 1,782,000 tons, or 7 per cent, over the first half of 1927.

Suez Canal. Goods shipped through the Suez Canal, exclusive of petroleum, totaled 12,165,000 metric tons in the first five months of 1928—an increase of 1,281,000 tons, or 11½ per cent, over the corresponding period of 1927.

Oils You'll Know

...are what you want, by every test for reliable quality and correct cost that you can make.

Since the days when coaling ships by hand began to go out of style, Associated engineers have been studying oils for marine use.

They are studying them now. Actual exhaustive tests in Associated laboratories result in products which meet the practical requirements of marine men. There is no guess-work in an Associated engineer's recommendation.

Through the years, this attention to marine lubrication and fueling demands has resulted in—

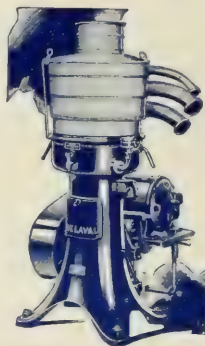
1. Bunker fueling facilities at Pacific Coast ports that fuel a ship without fuss or flurry and absolutely within the time set.
2. A delivery service of lubricating oil in drums and by tank trucks at Pacific Coast ports and at Honolulu and Manila that is complete to the last detail.
3. The development of oils for every type of marine work—specific oils refined to meet definite needs.

Performance records of knots steamed per gallon merit your investigation.

ASSOCIATED OIL COMPANY

You may never Know when a De Laval Oil Purifier has paid for itself—

but it will!



BEARING trouble—which is usually synonymous with lubricating trouble—comes at the most inopportune and unexpected times. When you get the warning, it is too late.

With a De Laval Oil Purifier connected to continuously remove sludge, water and abrasive particles from the oil, lubricating trouble is killed in the bud. You'll never know how many bearings have been saved—how much productive time has been increased.

Neither will you know exactly how much oil you have saved by eliminating the necessity of discarding used oil and substituting new.

Most users estimate, on the basis of previous experience, that their De Lavals have paid for themselves in a year or less. Some have saved their cost in a few weeks.

We shall be pleased to tell you how a De Laval will soon pay for itself on your ship. In writing please ask particularly for Bulletin 106-Y on lubricating and fuel oil.

The De Laval Separator Company

165 Broadway, New York 600 Jackson Blvd., Chicago

DE LAVAL PACIFIC COMPANY, 61 Beale St., San Francisco
THE DE LAVAL COMPANY, Limited, Peterborough and Winnipeg
Canada
ALFA-LAVAL CO., Ltd., 34 Grosvenor Road, London, S.W. 1

DE LAVAL
OIL PURIFIERS
Types for Lubricating Oil and Fuel Oil

Pacific Marine Review

The National Magazine of Shipping

NOVEMBER, 1928

CORONADO CHOOSES ATLAS-IMPERIAL

The new San Diego and Coronado auto ferry to be powered with two 500 h. p. eight cylinder Atlas-Imperials, each direct-connected to 325 K. W. Westinghouse generator, serving two 750 h. p. Westinghouse propelling motors



Dimensions:

Length Overall 190'-0"
Breadth of Steel Hull 43'-6"
Breadth Over Guards 60'-0"
Depth at Side Moulded . . . 14'-9"

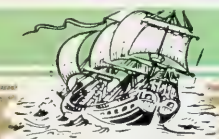
Building at The Moore Dry Dock Company—Oakland, California

ATLAS-IMPERIAL DIESEL ENGINE COMPANY

OAKLAND, CALIFORNIA

Branch Offices:

NEW YORK — CHICAGO — NEW ORLEANS — SAN DIEGO — LOS ANGELES — PORTLAND



Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION

A RECORD for DIESEL LUBRICATION

...and how it affects you

THE longest known non-stop run by a Diesel engine was recently completed by a 365 h. p. Busch-Sulzer engine at the Elko, Nevada plant of the Elko Lemoille Power Co.

The engine ran for 211 days and 10 hours—approximately 7 months—without a single mechanical difficulty. It was then shut down voluntarily. Wear on cylinders was found to

be less than even the most optimistic engineers had believed possible.

Union Diesel Lubricants were used exclusively in this record demonstration. It was probably the hardest test to which any Diesel lubricant had ever been subjected.

No ship is going to run a Diesel engine that long continuously.

But—when you lubricate with Union Diesel Lubricants you know that you are using the engine oil that has given an *unequalled* demonstration of operating efficiency.

Take Advantage of this Free Service

TO be sure that you are getting the greatest possible service and efficiency from your engine, consult one of our lubricating engineers. This staff is composed of experts familiar with the latest developments in Diesel engine lubrication. They are at your service, without cost or obligation, and will be glad to come aboard ship if you wish.

UNION DIESEL ENGINE OILS

UNION OIL COMPANY



Model of United States Ship USS Portsmouth

*F*RED J. BUENZLE, a retired United States naval officer, living in the Santa Clara Valley of California, has here reproduced faithfully in miniature every detail of the famous old fighting craft Portsmouth, on which he served as an apprentice seaman.

The Portsmouth, in 1846, under Captain Montgomery, took possession of San Francisco. Portsmouth Square is named after the ship; Montgomery Street after her captain.

This letter tells the story of WASHINGTON-ESTEP DIESEL POWER

 **KITSAP COUNTY TRANSPORTATION COMPANY**
SEATTLE, WASHINGTON

September 15th, 1923.

Washington Iron Works,
Seattle, Wash.
Gentlemen:

It may interest you to know some of the facts about the excellent success we have had with our new motor ferry "Bainbridge" since we attribute much of the satisfaction we have had from her to the economy and reliability of the Washington-Estep Diesel engines with which she is equipped.

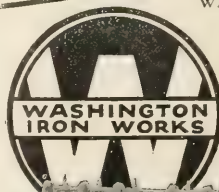
The "Bainbridge" went on the run between Seattle and Port Blakely on June 21st immediately following her trial trip and has been in steady operation in that service ever since. Up to the first of September our records show that she has carried a total of over ten thousand automobiles and over forty thousand passengers.

The reliability of both the main and the auxiliary Washington-Estep Diesel engines have more than come up to our expectations both as to power delivered and economy of operation, the total fuel consumption of the 800 h.p. main motor, the 44 h.p. auxiliary motor and the heating plant being only 35 gallons per hour of fuel oil and 1 1/2 gallon of lubricating oil per hour.

We are sure these figures will be of interest to you and wish you as great success in future installations as has attended the power plants that you installed for us.

Yours very truly,
KITSAP COUNTY TRANSPORTATION CO.

By *Burt S. Marley*



WASHINGTON IRON WORKS
SEATTLE, U.S.A.

British Columbia Representatives:
Vancouver Machinery Depot, Ltd.
Vancouver, B.C., Canada

Honolulu Representatives:
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Oregon Representative:
F. C. Purinton,
Phone 0552, Tigard, Ore.

California Agents:
W. H. Worden Co., Inc.
San Francisco, Los Angeles

Eastern Representative:
Sevton Engineering Corporation,
136 Liberty Street,
New York City, N.Y.

Southern Representative:
Eclipse Engineering Co.
121 Charles Street,
New Orleans, La.

**44 b.h.p. to
1800 b.h.p.**

Pacific Marine Review

The National Magazine of Shipping



Official Organ
Pacific American Steamship
Association

James S. Hines,
President and Publisher

Bernard N. De Rochie,
Vice-President and Manager

576 Sacramento Street, San Francisco

Member of Pacific Traffic Association

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Official Organ
Shippers' Association
of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

Coordinating Marine Practice

By A. V. Bouillon,*

Secretary, American Marine Standards Committee

THE American Marine Standards Committee, which functions as a unit of the Division of Simplified Practice, came into existence on November 10, 1922. It is a development of cooperation between the Department of Commerce, the United States Shipping Board, and the American Marine Association, for the purpose of promoting simplification of practice in ship-building, ship operation, and allied industries.

Duplication of effort is avoided as to standards affecting marine work already produced by others, by utilizing the work accomplished by the latter as far as found to meet marine requirements, and by constant contact with other organizations and mutual cooperation, as to subjects common to land and marine purposes now under, or that have been projected for, consideration on either side, thereby guarding against conflicting movements in national coordination.

In its plan of organization the underlying authority of the American Marine Standards Committee is vested in a membership enrolled from the marine and allied industries. An executive board elected annually from, and by, the membership, appoints and controls the administrative officers and technical committees, directs the general policies, and defines the technical working program. Its secretary, who is in effect the executive officer, has his headquarters in the Division of Simplified Practice.

The general field for the activities of the association has the following technical divisions: Hull Details, Engineering Details, Ship Operation Details and Supplies, Port Facilities, and Manufacture and Construction.

In promulgating standards, the American Marine Standards Committee does not follow the same procedure as the Division of Simplified Practice. The latter requires signed acceptances from at least 80 per cent of the manufacturers, distributors, and users by volume of annual production.

When a standard for the American Marine Standards Committee has been developed to the tentative stage by a subject committee, and has been passed as such by the respective technical committee, it is then submitted to

the interested elements for comment. If further study is needed, it is returned to the technical committee with the comments received. If, however, the study and development of such proposed standard are deemed to have been sufficient, the standard may be approved by favorable majority vote of the members of the board, as a "Suggested American Marine Practice;" by a favorable two-thirds vote of all its members the board may approve it as a "Tentative American Marine Standard;" and by favorable vote of four-fifths of all its members the board may approve it as "American Marine Standards."

To date there have been approved 80 standards, comprising 35 standards of hull details, 22 standards of engineering (machinery) details, and 23 standards on ship operation and supplies. In addition to the completed standards there are numerous proposed standards under consideration and the technical program is subject to expansion at any time.

There are two active special technical committees, viz., on Ship Stability and Loading; and the other on Bulkhead Rules and Subdivision. Three permanent technical committees have been organized, viz., on Hull Details; on Engineering (machinery) Details; and on Ship Operation Details and Supplies. Steps have been initiated to organize a permanent technical committee on "Port Facilities." Another technical division, viz., "Manufacture and Construction," is still in the process of organization. There are 42 subject committees, covering the following and kindred subjects:

Air Ports, Dead Lights and Deck Lights; Bitts and Cleats; Chocks; Hawse and Mooring Pipes; Structural Insulation; Joiner Hardware and Skylight Lifting Gears; Plumbing Fixtures, Deck Drains; Cargo and Oil-Tight Hatch Fittings; Water-Tight and Non-Water-Tight Hinged Doors and Fittings; Rail and Awning Stanchions; Cargo Booms and Fittings and Rigging and Deck Fittings; Metal Berths and Spring Mattresses; Hose Racks and Reels and Fire Buckets and Racks; Lifeboats and Life Rafts, and their Stowage, Handling and Equipment; Cows and Fittings for Ventilators; Insulation of Piping and Machinery; Shafting,

*Abstract of an article printed in the United States Daily.

Bearings, Propellers; Condenser Tube Ferrules; Pipe Flanges, Pipe Fittings, etc.; Piping; Lubrication Systems and Appliances; Gauges, Thermometers, Pyrometers.

Also, Rules for Boilers and Pressure Tanks; Hose Plugs and Couplings; Fire Clay Refractories; Metallic Packing for Condenser Tubes; Water-Tight Receptacles for Ship Electrical Installations; Care and Operation of Boilers; Care and Operation of Propelling Engine and Main Condenser; Care and Operation of Engine Room Auxiliaries; Care and Operation of Deck Machinery; Care and Operation of Oil Burning Apparatus and Handling of Fuel Oil; Care and Operation of Lubrication Systems; Operation of Ship; Care and Maintenance of Hull and Fittings; Care and Maintenance of Oil Tanks; Care and Operation of Diesel Machinery; Hose-Water, Fire, Steam and Oil; Chinaware, Glassware and Oil Lamps; Blankets, Mattresses, etc., and Linen and Cotton Textiles; Safety Equipment,

Spare Parts for Machinery and Deck Gear, Life Preservers.

That there is a continued growth of interest in the simplifications of ship construction, ship operation, and port facilities, is evidenced by the several recent reports of the Secretary of the American Marine Standards Committee. The report for the first quarter of 1928 shows that four meetings of subject committees and conferences were held during that period, exclusive of the annual executive board meeting and the general meeting of the membership of the organization.

Ten projects were submitted to subject and technical committees for consideration, and two groups of proposed standards were submitted to the membership for approval. During the second quarter of this year, the executive board held one meeting at which it approved the reorganization of the Technical Committees on "Hull Details" and on "Engineering Details," as well as giving approval to five standards for promulgation.



Duplicate Order For Inter-Island Steamship

Inter-Island Steam Navigation Company, Honolulu, Gives Bethlehem Shipbuilding Corporation and Westinghouse Electric & Manufacturing Co. Repeat Order for Successful Steamer

GREAT interest was engendered on the Pacific Coast last spring when the geared turbine steamship Waialeale ran her trials and later when she arrived at her home port in Hawaii. The ship, which was the first vessel propelled by geared turbines to be operated by the Inter Island Steam Navigation Company of Honolulu, was a distinct credit to her builders, designers, and all connected with her conception and construction.

That such an opinion is shared by her owners is evinced by the fact that a contract has just been entered into with the San Francisco yard of the Bethlehem Shipbuilding Corporation to furnish an exact duplicate of the Waialeale for operation in the same service.

A fully illustrated, detailed description of the Waialeale was published in the July issue of Pacific Marine

Review. The general particulars of the new vessel are as follows:

Displacement, tons	4300
Deadweight capacity, tons	1800
Refrigerating capacity, tons	30
Over-all length,	310'10"
Length between perpendiculars	295'0"
Beams	48'0"
Depth molded to shelter deck	27'0"
Speed, knots	15
Shaft horsepower	4000
Fuel oil capacity, tons	530
Fresh water capacity, tons	150
Four Babcock & Wilcox oil burning water-tube boilers	
Two main turbines, 2000 shaft horsepower each, com-	
plete expansion impulse-reaction, driving the pro-	

pellers at 135 revolutions per minute through single case, double reduction, single pinion floating frame reduction gears and designed to operate with two 2-pass surface condensers located underneath the turbines and being arranged to form the foundations for the latter; so that no exhaust trunks or drain pipes are needed.

Two geared turbine circulating pumps

Three vertical motor driven condensate pumps

Two sets of twin, 2-stage condensing air ejectors mounted on I & A condensers

Two 75-kilowatt, HNC type geared turbine direct current generators to furnish auxiliary power and light

One auxiliary condenser

One switchboard

Except for the boilers, all of the machinery listed above will be furnished by the Westinghouse Electric and Manufacturing Company, as will be the galley ranges, bake oven, 100 electric fans, the forced draft fan motors, and the fuel oil service pump motors.

As in the Waialeale, accommodations will be provided for 218 first class and 96 steerage passengers, in addition to a crew of 67 men. There will be two continuous steel decks, three cargo holds, two steel pole masts, two 3 ton booms, two 5 ton booms and one 20 ton.

Aside from such desirable features as reliability, simplicity, duplication, and standardization, the executives of the Inter Island Steam Navigation Company were influenced in their selection of exact duplicate propelling and auxiliary machinery as installed in the Waialeale because of the latter's excellent economy, and lack of noise or vibration in the main geared turbines at any power or speed.

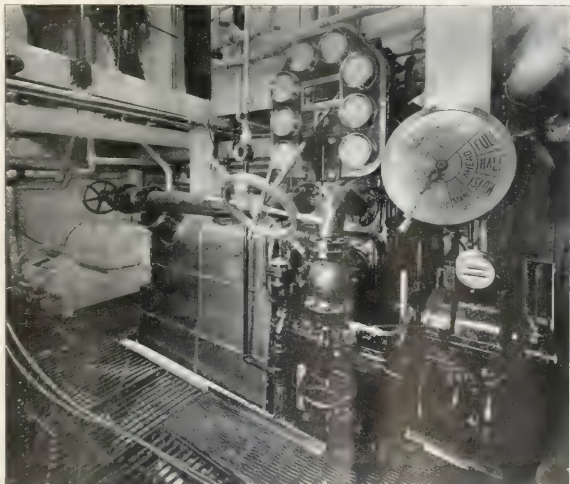
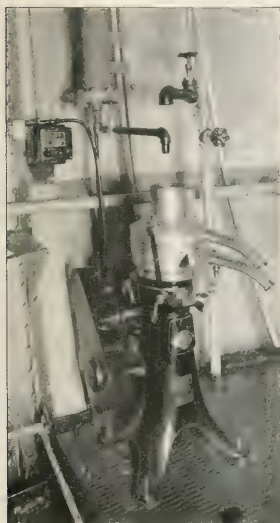
Since the Hawaiian Islands are located a considerable distance from the source of fuel oil supply, the question of fuel oil economy is an important one. Because

of the excellence of the design, as a result of their continual efforts and experience toward improving machinery, the manufacturers of the propulsion machinery have been able to produce geared turbines of very high economy. Since going into service last June, the Waialeale is reputed to have had an average sea consumption of 0.9 pound of fuel oil per shaft horsepower per hour for all purposes.

It is encouraging to note that the contract for this new vessel was not contingent upon mail contracts or other similar government aid, but was placed to expand the services of an organization which has continued to grow and prosper at a time when conditions have been adverse to the successful operation of American vessels. It is also of interest to know that the main propelling, condensing, and electric machinery of the Waialeale are not only of American manufacture, but are also 100 per cent American designed.

As we go to press, the news is confirmed that Hawaiian interests have ordered, from Westinghouse Electric & Manufacturing Company, machinery for a smaller steel steamer to be used in the transportation of passengers and cattle. This vessel will be driven by a single screw and will have a single, geared-turbine unit practically a duplicate of the units in the Waialeale. The nozzles on this unit will be arranged for 1700 shaft horsepower. It is probable that this vessel will be built at the Potrero Works of the Union Plant, Bethlehem Shipbuilding Corp., Ltd., San Francisco.

The Inter-Island Steam Navigation Company is to be congratulated on the foresight and vision shown by its executives. These new modern vessels, with economic, up-to-the-minute equipment, are a real asset. The Waialeale is so popular that she has already demonstrated her ability to earn substantial dividends for her owners.



Two views showing machinery in the engine room of the Waialeale. At the left, De Laval oil purifiers that insure clean oil for the turbine bearings and gears. Above, one of the main propulsion units, a Westinghouse double-reduction gear, complete expansion, impulse reaction turbine.

Shallow Draft Gasoline Tanker

Union Plant of Bethlehem Shipbuilding Corp. Building Sterling Gas Engine
Equipped Bulk Gasoline Cargo Tanker for Sacramento River
Service of Standard Oil Company

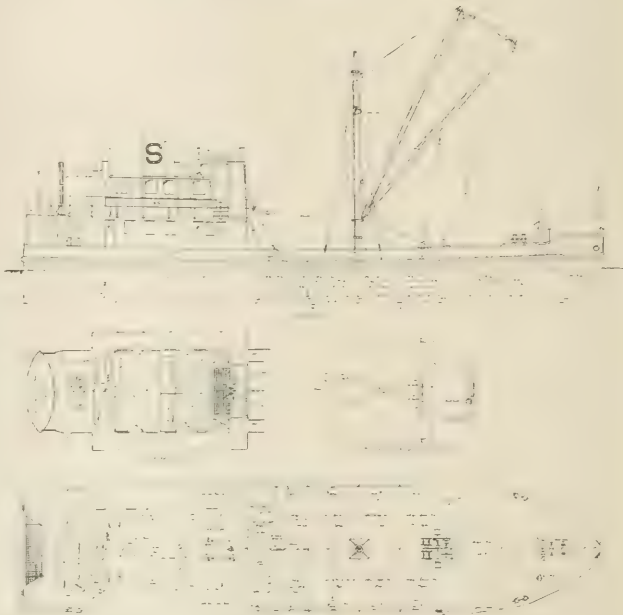
SALES of Standard Oil Company (Calif.) in the delta and river regions adjacent to San Francisco have been increasing very rapidly and the company has recently ordered a new self-propelled shallow draft barge to more adequately service this market.

This barge is to be built by the Potrero Works, San Francisco, of the Union Plant, Bethlehem Shipbuilding Corporation, Ltd. She will have a length over-all of 101 feet 4 inches and a length between perpendiculars of 100 feet. The molded beam is 22 feet; and the beam over guards, 23 feet 5 inches. Molded depth 5 feet 9 inches; loaded draft, in fresh water 5 feet. The deadweight capacity of the barge at this draft is 94 tons.

The arrangement of the cargo tanks and hold, crew accommodations, and machinery is clearly shown on the reproduction of the architect's preliminary sketch. The cargo space on this boat is figured to take 22,000 gallons of gasoline weighing 63½ tons and 24.6 tons of package freight.

Propulsion machinery will consist of two 150 brake horsepower Sterling gas engines driving twin screws, and it is estimated that this plant will give the barge a speed of 8 knots an hour in deep water. The gasoline engines will be connected to the propulsion shafts by reduction gearing.

A gas engine located in the engine room will drive the Kinney cargo pumps by a shaft passing through bulkhead stuffing box into the pump room, the one



Outboard profile and deck plans of shallow draft tanker for Standard Oil Company (Calif.)

shaft driving four cargo pumps through entirely enclosed silent chain drives. A 5-kilowatt gas engine driven generating set is installed in the engine room for electrical lighting and power, the after end of the shaft of this engine being connected through a clutch to a bilge pump. A gas engine driven winch and two booms are arranged forward of the mast to handle the package cargo.

New Coronado Ferryboat

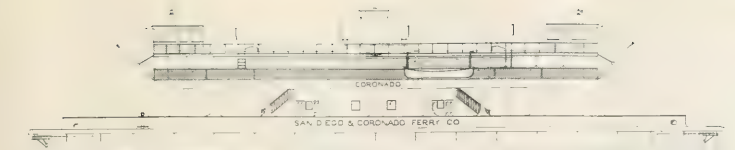
The Moore Dry Dock Company Building Atlas-Westinghouse Equipped
Diesel-Electric Ferry for San Diego Bay Service

THE San Diego and Coronado Ferry Company has recently ordered from The Moore Dry Dock Company of Oakland, California, a diesel-electric, all steel vehicular ferryboat for the San Diego-Coronado run. The preliminary outboard profile reproduced above gives a very good idea of the appearance and the arrangement of this boat.

She will have a length over-all of 190 feet; length between center line of rudder pintles of 98 feet; a mold-

ed beam of 45 feet 6 inches; and beam over guards of 60 feet; with a molded depth of 14 feet 9 inches.

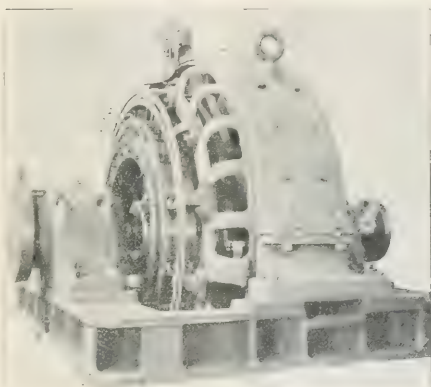
The most noteworthy feature of the hull design is the open arch construction of the superstructure, which gives her a light, graceful appearance, and, in the sheltered waters of San Diego Bay, with its well-known mild round-the-year climate, will provide practically an open air deck for all vehicles. Her capacity in ordinary passenger cars is 55.



Above is shown the preliminary outboard profile of the new diesel-electric ferryboat for Coronado service on San Diego Bay. Note the open steel truss supporting upper deck. At right, one of the 750-horsepower, single-armature, direct-current, Westinghouse motors which drive the propellers for this ferry. Power will be supplied by two Atlas-Imperial-Westinghouse 325 kilowatt generating sets.

This ferryboat will be propelled by independent Westinghouse, 750-horsepower, single armature, direct current motors, one driving the forward propeller, and the other the after propeller. Power for these motors is supplied by two 250-kilowatt Westinghouse, direct current generators, each driven by a 500-horsepower Atlas-Imperial, 8-cylinder, full diesel engine. The operation of motors will be on the Ward-Leonard system, with control from either the engine room or the pilot house, as may be desired. All auxiliary machinery, including steering gear and pumps, will be electric motor driven, the motors and their controls being supplied by the Westinghouse Electric & Manufacturing Co.

Cordes Brothers of San Francisco have been retained by the ferry company to supervise the building of this ferryboat.



The Queen of the Pacific

Matson Navigation Company's Ocean Greyhound Completes Twelve Months of Satisfactory Service

RECENTLY rounding out a year's uninterrupted service between San Francisco and Honolulu, the Malolo, crack liner of the Matson Navigation Company's fleet and fastest commercial vessel on the

Pacific Ocean, is receiving many tributes from officers and passengers on the regularity of her schedule, the comfort of her accommodations, and the excellence of her cuisine.

Leaving San Francisco every other Saturday, she made her schedule regularly for the twelve months, showing 26 round trips with no operating trouble. This means 110,000 miles at an average speed of a little under 21 knots in all kinds of weather.

Our illustration is a rather unusual picture, showing a self-propelled bulk oil barge fueling the Malolo at the Matson dock, San Francisco, on the day her little sister, the Waialeale, shown at the right, was accepted by the Inter-Island Steam Navigation Company. This scene is indicative of the close inter-relationship between San Francisco and Honolulu. The Golden Gate is the natural approach to the "Cross Roads of the Pacific" for the commerce and industry of North America.



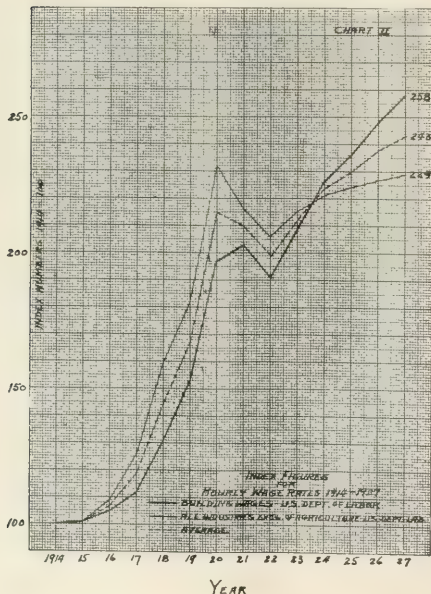
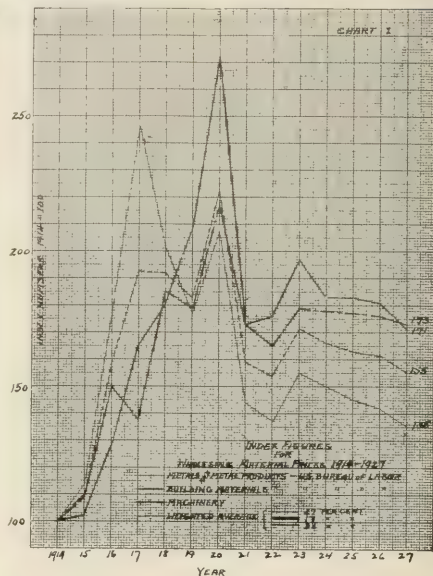
The Status of Shipbuilding Prices

A Statement by the National Council of American Shipbuilders

A NUMBER of our well known shipping concerns have more or less frequently of late recorded what they feel is a very general impression among shipowners and ship operators; namely, that the selling price of the modern ship built in America is far too high. Such a contention, while trivial in itself, ignores two primary factors in the cost of construction of modern steam and motor ships and should not be allowed to become a popular misconception. The present burdens of the shipbuilder are already heavier, in most cases, than he can bear.

Impartial investigation of the trend of shipbuilding prices in this country will show that the quotations now being made on new construction by the leading shipyards of the United States are fully justified. This conclusion has been arrived at by first studying the cost trend of ships built in this country from 1914 to date and comparing the increase in price shown with the increase in cost of materials and labor in the United States as reported for this period by the United States Department of Labor Statistical Bureau.

On Chart I there have been plotted the index numbers for the wholesale prices of three commodity groups, selected as covering in a general way the same class of materials that enter into ship construction. It will be noted that the price of building materials was 71 per cent higher in 1927 than in 1914; metals and metal products 35 per cent higher; and machinery 73 per cent higher. These three curves have

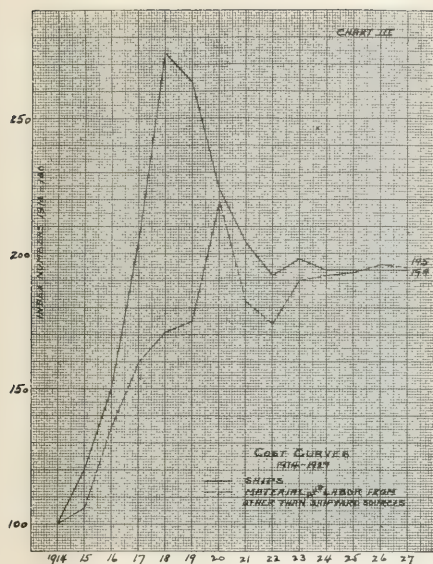


been averaged or combined in a fourth curve by giving weight to the fact that materials under these three general headings enter into the construction of say a 10,000 deadweight ton cargo ship in about the following percentages: Metals and metal products, 47 per cent; building materials, 17 per cent; machinery, 36 per cent. This average curve shows that material prices increased 55 per cent over the 13 year period.

Index figures of the Department of Labor for hourly wage rates are recorded on Chart II. There are three curves plotted. The first gives the trend of hourly wage rates for all reporting industries, exclusive of agriculture, for the years 1914-1927 and discloses the fact that these rates were 129 per cent higher at the end of the period than in the beginning. The second curve covers hourly wage rates of the building industry and was selected as covering a number of the trades found in the shipyards. A very large increase in these rates is also recorded, the figure given for 1927 being 158 per cent greater than that for 1914. A third curve has been plotted giving the average of these first two; and shows that the average increase in hourly wage rates over the period amounted to 143 per cent.

As of interest, right here it should be stated that the average earned rate per hour of the yard forces of one of the foremost yards in this country increased 146 per cent from 1913 to 1928.

On Chart III two curves have been plotted. One shows the index figures for the cost or selling price of merchant ships built in the United States during the



years noted, and has been copied from a similar curve on file with the Government at Washington. The other is a weighted curve, combining the average material and labor curves of Charts I and II. It has been assumed in plotting this second curve that in the year 1914 the elements of material and labor entered into the shipbuilders cost in the proportion of 55 per cent for material and 45 per cent for labor. It is seen now from a glance at Chart III that shipbuilding costs have not increased at a faster rate than have the general costs of material and labor, although when one remembers the precarious condition of the shipbuilding business in 1914, with prices in some cases at cost, a very rapid rise in quotations would have seemed inevitable. A sharp peak in prices did occur during the war when ships were at a premium, but this prosperous period only served to tide the yards over until about 1922. Since then, shipbuilding has settled back into another slump, resulting in a blighting competition between the few plants that have managed to stay in business. Applying these curves to shipbuilding costs on a dollar basis, the 1914 cost per dollar was 55 cents for material and 45 cents for labor. Material which cost 55 cents in 1914 had by 1927 increased in cost 55 per cent, or to 85 cents. The 1914 labor cost of 45 cents in 1927 had increased 143 per cent, or to \$1.09. The 1927 equivalent of the 1914 shipbuilding dollar is therefore the sum of these increased cost figures; material, 85 cents, plus labor, \$1.09, make \$1.94. Since the cost index of ships from Chart III is 194, present selling prices are comparatively as low as they were in 1914.

Causes of High Costs

It is not difficult to explain or understand why the present situation exists or why rock-bottom prices must of necessity now prevail when we consider the following causes:

1. The Reduction in Armament Conference which almost wholly suspended naval work and left the shipyards dependent upon commercial work.
2. The Government's recent policy of building new vessels in Navy yards.
3. The existence of the vast war fleet of ships which the Government has been selling off as fast as the market could absorb them.
4. The admission to the coastwise trade, under Section 22 of the Merchant Marine Act of 1920, of 65 American-owned but foreign-built vessels, resulting in stagnation of new construction for coastwise service.
5. The low cost of building ships in foreign yards. Vessels can be purchased abroad for one-half the price that must be asked for similar vessels in this country.

Such facts as these have offered scant encouragement to any selling price greater than the bare cost to the shipbuilder. In spite of the precarious condition of the industry and the knowledge that little or no profit is included in the price the shipbuilder gets for his product, it is to the shipbuilder's credit that the ship owner is receiving a much better ship for his money today than ever before. This country is now in a period of great engineering and scientific advancement to which the shipbuilding and marine engineering industry is contributing its share. While several veteran shipyards have in recent years been forced to close their doors and liquidate, it is a noteworthy fact that faulty design or poor workmanship was never a contributing cause. In spite of almost insurmountable handicaps, continuously better ships have been built.

(To Be Continued)

Shipowners' Election

At the annual meeting of the Shipowners' Association of the Pacific Coast, held September 27, 1928, at San Francisco, F. J. O'Connor was re-elected president for the sixth term; R. W. Myers and James H. MacLafferty were reelected vice-presidents; and Nat Levin was reelected secretary-treasurer. The Shipowners' Association of the Pacific Coast is composed of the following executives:

F. J. O'Connor, of the Donovan Lumber Co.; R. W. Myers of Hobbs, Wall & Co.; James Tyson of the Chas. Nelson Co.; S. M. Hauptman of McCormick Steamship Co.; L. C. Hammond of Hammond Lumber Co.; Otis R. Johnson of National Steamship Co.; L. C. Stewart of Sudden & Christenson; S. D. Freeman of S. S. Freeman & Co.; H. F. Vincent of E. K. Wood Lumber Co.; W. R. Chamberlin of W. R. Chamberlin & Co.; John L. Reed of J. R. Hanify Co.; and J. C. McCable of A. F. Mahony & Co.

The five years during which F. J. O'Connor has served as executive of the Shipowners' Association of the Pacific Coast have witnessed several forward movements in the cooperative development of Pacific Coast shipping. Notable among these are the Marine Service Bureau, which, in its various departments, has worked to bring about a very much better understanding between the shipowners and their personnel afloat; the Accident Prevention Department, which is making a very notable decrease in the loss time and fatal accident records of the ports of California. In addition to cooperating in these movements, the Shipowners' Association of the Pacific Coast has helped materially in the passage of legislation beneficial to the American merchant marine.

North German Lloyd Motorship Saale

A Sulzer-Schichau Engined Fast Modern Motorship; 15.7 Knots; 10,600 Tons Deadweight Capacity; 120 Barrels of Oil a Day

LAST month we again had a notable motorship calling at Pacific Coast ports on her maiden voyage.

The motorship Saale is the first of two new vessels the North German Lloyd is putting into service between Germany, Belgium, and Pacific Coast ports. The second boat, the Havel, is due in San Francisco the latter part of November.

Visiting the Saale one gets the impression that she has been built by experienced shipbuilders (Schichau Works at Danzig) with a view to bringing out a very economical fast freighter. This ship is 469 feet 2 inches in length with a beam of 59 feet and a depth of 34 feet 2 inches. The deadweight capacity is 10,600 tons. She is equipped with a 5000 brake horsepower at 95 revolutions per minute

Schichau-Sulzer 2-cycle engine. On trial, with the vessel in ballast, a mean speed of 15.6 knots was attained, and on her way to the Pacific Coast the maximum average daily speed was 15.7 knots.

There are accommodations for 12 first class passengers and, in addition to the dining room, a smoking



Fig. II. The upper platform of the engine room of the motorship Saale showing the tops of cylinders and valve mechanism of the 10 cylinder Schichau Sulzer.

room is provided.

The vessel is equipped with an over valve gear. In the center of the Oertz rudder, as can be seen in the engine is the overspeed Sulzer type illustration, Fig. I. This is the new ball governor which puts the indistinct line rudder aerofoil section, vidual fuel pumps out of action one which gives greater effective steering effort with very small helm and provides ideal lines for the propeller stream. The steering gear operation has proved in actual service

erating this rudder is electrical. The motor works directly on the quadrant through a worm and spur gear transmission. Control is through electric telemotor from the bridge and a motor-generating set in the steering gear compartment.

To insure maximum efficiency and economy of operation, single screw propulsion was adopted and the single-acting, multi-cylinder, two cycle engine is the ideal type for this purpose. There is nothing new in the construction of the Saale's engine that has not been Sulzer practice for many years and the ten-in-line cylinder arrangement evidently does not involve any new problem.

Fig. II shows the upper part of the engine room and gives a particularly good view of the top of the main engine. It also gives a good idea of the simplicity of the Sul-

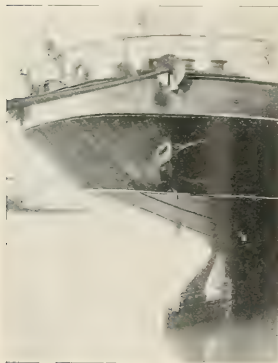


Fig. I. The stern of the Saale showing anchor and top of Oertz rudder.

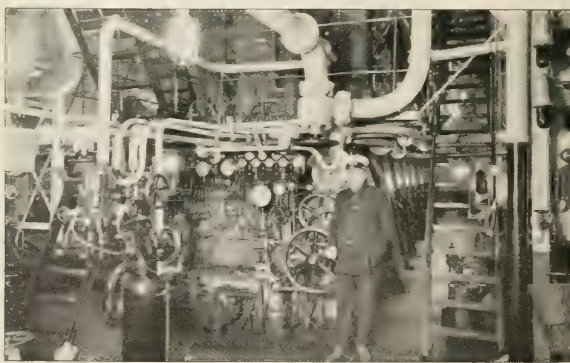


Fig. III. Lower grating of engine room of the Saale showing control station for the diesel engine.



Fig. IV. View of lower grating in the engine room forward of engine showing lubricating pumps, De Laval oil purifiers, and switchboard.

in all Sulzer installations that the engines can work with certainty and without any great fluctuation in speed, even in the heaviest weather, without any adjustment of the hand regulation.

Behind Mr. Freitag, second engineer, in center of the picture, is the exhaust pipe leading up to a muffler in the stack. At his right can be seen the top of the high pressure starting air bottles which are mounted to the wing fuel tanks. Bolted to the aft bulkhead are the two spare valve cages, each containing a fuel and starting valve. To the left of the exhaust pipe is the cooling water discharge and to the right, the uptake from the small auxiliary boiler which is provided for heating purposes and is used in cold weather only.

As can be seen from Fig. III the next lower platform gives access to the hinged crosshead inspection doors. The covers for the "lanterns" can also be seen in the lower part of the cylinders. This is a distance-piece located between cylinder and crank case and fitted with oil scrapers which prevent the dirty lubricating oil from the cylinders reaching the crank case. In the front, the lantern covers are bolted on, while in back, or on the exhaust side, they are hinged and so permit ready observation of the working pistons for about three-quarters of their length. This is a highly desirable feature as it gives the engineers a continuous check on conditions of the working pistons.

The crank case is enclosed and oil and vapor-tight. The large hinged doors on both sides give easy access

when overhauling the engine and the work can be done with a minimum of time and effort. While in Portland, one piston was pulled for inspection and the whole job of dismantling and assembling was easily completed in 8 hours.

The crankshaft is in three sections; one section for each group of five cylinders and one section for the two compressor cranks.

A single collar thrust bearing of Sulzer design is firmly connected to the bed plate and thus forms a part of the engine. This arrangement insures absolutely accurate alignment with the main bearings and is recognized as an excellent feature by shipbuilders and ship owners. This thrust bearing is connected to the forced lubricating system for the bearings and does

not tend to heat or seize even when working under the most severe conditions.

The scavenging air is supplied by blowers (turbo-blowers) of which there are three. Two blowers are required at full load while one would be sufficient up to half speed.

The maneuvering gear is located at forward end of engine. This arrangement is very desirable and highly preferred by the engineers because it permits easy access to and view of all auxiliaries and switchboard directly from operating stand.

All auxiliaries and switchboard are at forward end of engine room as shown in Fig. IV. The space on either side of the engine from about the center of engine space aft is taken up by wing tanks, there being three on each side with a total capacity of approximately 7900 barrels.

There are three auxiliary diesel generating sets of 200 kilowatt capacity each. These engines are 300 revolutions per minute, 6-cylinder, 2-cycle, solid injection Sulzer units. In port one engine is sufficient to carry the winch load while at sea two are required to carry the blowers and other auxiliary load. One 2-cylinder, 3-stage auxiliary compressor directly driven by a 255-horsepower 300-revolutions per minute motor is provided.

Seawater is used throughout for cooling and two centrifugal pumps are provided for this purpose, one being a spare. These are Sulzer 2-stage pumps and are of special interest in that all the water neces-

(Continued on Page 33, Blue Section)

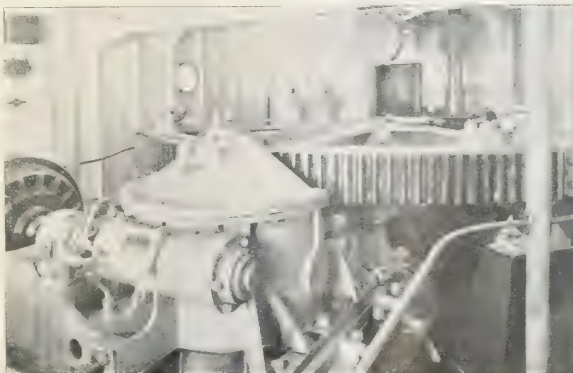


Fig. V. Electrical steering gear of motorship Saale.



Workboats and Their Power Plants

California Tuna Fleet

New and Larger Diesel Driven Fishing Boats Bring Success to Southern California Fishermen

By O. H. Barnhill

PROFITABLE catches made by pioneer vessels of southern California's new tuna fleet during the past two years resulted in the building of several more boats of the same type. A number of even larger motorships probably will be added to the flotilla next year. A \$50,000 vessel has been known to pay for itself in a single season.

The new boats have been successful because they were able to make long cruises in quest of the elusive "chicken of the sea." As local supplies of this fine fish became depleted it became necessary to go farther and farther from the base ports of San Pedro and San Diego.

These trips led operators into Mexican waters, where they had to pay heavy taxes on their fares. Beginning with a modest export duty of \$5.00 a ton, Mexico gradually raised her tariff and added other fees until these taxes totalled about \$40 a ton on all market fish taken off the Mexican coast and sold north of the international boundary. Imposition of this tax, considered by American exorbitant, resulted in evasion, bribery, and bad feeling. In order to avoid an unpleasant and unprofitable situation, California fishermen built boats large enough to enable them to clear for the high seas and operate entirely outside the three-mile limit. They can carry all supplies needed for cruises of 4000 miles or more and remain away from the home harbor two to four weeks.

Various attempts were made to induce Mexico to reduce her fish taxes. She suggested an export duty of \$20, provided all American boats would pay this amount on their catch, regardless of how far from shore they operated. A blanket concession of \$900,000 per year also was proposed. These sugges-

laws, when a change of Mexican lions were in a fair way to become presidents delayed the matter by placing it in the hands of new fisheries officials.

Meanwhile, American fishermen continued building bigger and better boats, which operated independently on the high seas. Cannermen formerly sent small gasoline boats south, together with a few large schooners for bringing home the catch. This method was recently discontinued, packers relying on the new tuna motorships to supply their canning plants with raw material. Instead of the customary two or three hundred small boats operating in the vicinity of Turtle Bay, Lower California, this autumn there were only 30 such vessels fishing for tuna in that region.

Seeing an important source of revenue slipping away from her—last year we paid Mexico \$600,000 on fish caught south of the line—our southern neighbor recently reduced her fish tax to \$21.40. Boats operating outside the three-mile limit need pay only \$5 a ton for shore anchorage.

This action of the Mexican gov-

ernment in reducing to reasonable proportions one of the greatest obstacles to profitable foreign fishing has caused great rejoicing among southern California operators. It is a substantial reward for the enterprise and ingenuity of American fishermen, boat builders, and engine manufacturers in meeting a difficult situation.

The tuna fleet now numbers between 50 and 60 diesel-driven live-bait vessels. Most of them are 75 to 115 feet in length, but the smaller ones ranging down to 50 feet.

Suitable size, though a necessary feature, is not the only requisite for a successful tuna craft. Economical power is a prime essential. This is made possible by the modern diesel engine, which will propel a 100-foot vessel loaded with 100 tons of iced fish at a total expense for fuel and oil of less than five cents a mile.

So simple of operation are the new diesels that trained engineers are not needed to run them. A member of the crew, usually a Portuguese or Japanese fisherman, generally serves in the dual capacity of navigator and engineer, operat-



This smart fishing boat bears the fine old American name of Flying Cloud.

ing the diesel from the pilot house.

"In our Mexican tuna fishing trips we travel along a very rugged and dangerous coast line, where another boat is seldom seen," relates M. O. Medina, owner and operator of the Atlantic, among the first of the larger tuna boats. "Our confidence in our Union diesel is so great that we carry no extra parts, except a few cotter pins, screws, bolts and nuts, together with a spool of Palmetto packing.

"During the Atlantic's first 11 months of operation we made ten 2500-mile trips, yet did not need to touch a single engine part, valve, or other piece of mechanism. The exhaust and fuel valves were afterwards removed and cleaned, being found in good condition, with perfect seats. The fuel nozzles were clean and spraying the proper amount of oil. Since then we have made eight trips of 2000 miles each, without any engine trouble whatever and without cleaning or replacing any part."

This record (by no means unusual) illustrates the possibilities for service of a first-class diesel engine, intelligently operated. Some marine experts believe that, considering the large amount of money tied up in one of the larger tuna boats—\$65,000—it would pay to employ an experienced and competent engineer for such vessels.

This would not only prevent occasional costly mistakes of operation, but would probably reduce the heavy insurance rate. The moral hazard also would be materially decreased. Although southern California fishboat operators are not paid salaries, it should be possible to find licensed engineers willing to work for a share of the profits, which sometimes are very attractive.

The second requisite is adequate live bait carrying capacity. Some varieties of tuna, such as albacore and bluefin, are too lively for netting therefore a large share of the total tuna catch is taken with hook and line, using live sardines or other small fry for bait. Some boats get their supply of sardines near the Mexican shore, in the vicinity of the tuna banks, but this brings the operators under the jurisdiction of the Mexican government, which levies a tax on the catch.

Large tuna motorships take along sufficient live bait for a cruise of 2000 to 4000 miles, which enables them to operate entirely on the

high seas. Four or five tons of sardines are kept in a huge box made of three-inch redwood planks and occupying all of the after deck except a narrow runway for the fishermen, who operate from the vessel's stern. The capacity of the bait box is augmented by two or three bait wells extending down into the hold immediately forward of the box, which sets up on the deck. The bait tanks hold 80 to 90 tons of water.

The bait fry are kept alive by constantly circulating salt water through the minnows with centrifugal pumps, which force sea water through an 8-inch pipe at the rate of 1000 gallons per minute. If these pumps should stop for even a few minutes the sardines would begin to die. Therefore reliable engine power is absolutely necessary. A small auxiliary engine, sometimes an old auto motor, operates the pump while the vessel is at rest.

The third difficulty to overcome in the tuna industry was the transporting of fresh fish long distances over semi-tropical seas and delivering the catch in good condition. This problem was solved by mechanical refrigeration and cork insulation. As the fresh fish are caught they are packed in crushed ice, layers of ice and fish alternating. One ton of ice is needed to keep fresh three tons of fish. For short, quick trips insulation and ice machines are unnecessary, but for long cruises they are absolutely essential, as costly experience clearly demonstrated. A little delay or an overload often results in a partially spoiled cargo, which has to be sold at unprofitable prices. Often can-

ners were formerly losers in such deals, because it is sometimes difficult to detect slight decay until after fish are cooked, when "honey-combing" of the meat betrays unsound condition.

Refrigeration not only keeps the catch fresh, but reduces by one-third or more the amount of ice needed. After installing mechanical refrigeration, the Atlantic reduced her ice cargo from 500 to 240 cakes. Each cake weighs 300 pounds and costs 90 cents—\$6 a ton—crushed. A direct saving of \$234 per trip was thus effected, or \$2340 per year, as the Atlantic averages ten trips per season.

Some operators made the mistake of installing too small a compressor, which sometimes resulted in losing part of the cargo. Before icing a boat the compressor is run until the temperature of the hold is reduced to 32 degrees. Little mechanical refrigeration is needed until fish are introduced into the hold, after which a compressor of adequate size need be operated only about half the time. A small machine, however, must be run continuously and if operation is interrupted there is danger of spoiled fish.

Cargo holds are insulated with two to four inches of pure sheet cork laid in asphaltum. Bait wells also are insulated and after emptying are filled with market fish. Cork is laid under the deck, on bulkheads, and between frame timbers. Some of the newer boats have cork placed inside the ceiling, leaving all the space between the frames for ventilation.

(To be Continued)



The deepsea tuna fishing boat Lusitania.

An Ideal Fishing Boat

General Engineering & Drydock Company Building Fine Diesel Engine Trawlers for A. Paladini, Inc.

THE fishing workboat Catherine Paladini was recently completed by the General Engineering & Drydock Company, Alameda, California, and put into service by her owner, A. Paladini, Inc., large fishing company of San Francisco. She has proved such a splendid addition to the fishing fleet that a repeat order has been placed for a craft which will act as a tender for the Catherine Paladini. The new vessel will be slightly smaller but will be built with the same care and attention to detail that characterizes the work of the General Engineering & Drydock Company.

The Catherine Paladini is 78 feet long, 18 feet 6 inches beam, and 6 feet 6 inches depth. Her engine, an Atlas-Imperial diesel of 200 horsepower, runs like the proverbial watch and drives the hull at 10 knots loaded sea speed. Ets-Hokin & Galvan of San Francisco supplied the electrical equipment.

Everything to make the vessel homelike was worked into her design and construction. Her length,



The Catherine Paladini running 10 knots on her trials on San Francisco Bay. She is powered with an Atlas-Imperial 200-horsepower diesel.

beam, and depth give her ample room for stowage and for all the extras that make for comfort afloat.

Speaking of the Catherine Paladini, one of the members of the owning firm made mention of the fact that she is such a comfortable craft that the crew does not care to take their nights off on shore when in harbor, preferring to sleep on board.

engines to perform under all conditions and without the requirement of more than casual observation is of monetary value to every fisherman. Its ease of starting, simplicity of operation, quick development of maximum power, and absolute dependableness have made it an outstanding motor.

The ability of the Frisco Standard engine to operate at a slow speed requiring but a minimum amount of fuel is another factor of decided advantage to the fisherman.

This record attained by Prosperity A is a big argument in the favor of gasoline engines because there is no substitute for results.

Prosperous Fishing Boat

THE Prince Rupert combination purse seine and halibut boat, Prosperity A, is computed to be the high boat of the Canadian halibut fleet so far this season. Captain Jack Christiansen reports pro-

ceeds estimated at \$1500 per man.

The excellent record of the boat is partially credited to the splendid performance of the 40-horsepower Frisco Standard engines with which it is equipped. The ability of the



The Prosperity A of the British Columbia halibut fleet operating out of Prince Rupert. A 40-horsepower Frisco Standard engine provides the power.

Boat Yard Busy

Anderson & Cristofani, shipbuilders at Hunter's Point, San Francisco, have just completed a workboat for the Dahl Engineering & Electric Co. This craft will be engined by a 70-horsepower, 2-cycle Mianus diesel of four cylinders. Mr. Silva, the company's engineer, claims that she will show a marked advantage in fuel and upkeep economy. The new vessel, which, by the way, has been christened Mianus, is 55 feet length, 14 feet beam, with 5 foot draft. She has been constructed in the same substantial manner as are all vessels turned out at this yard.

Anderson & Cristofani are also building a fishing craft for Fort Bragg district which is 44 feet length, 11 feet beam. She will have a Hicks gas engine of 16 horsepower at the start.

Vancouver's New Fireboat

Burrard Dry Dock Company Delivers Fine New Sterling-De Laval
Equipped Fire Fighting Craft J. H. Carlisle

THE Burrard Dry Dock Company Ltd. of North Vancouver, British Columbia, have just completed and delivered a fire boat for the City of Vancouver, which is intended for use in the industrial area surrounding False Creek.

The boat was designed by A. Bennett of Vancouver and built to British Corporation requirements, the pumping equipment being in accordance with the requirements of the British Columbia Board of Fire Underwriters.

Her principal dimensions are as follows:

Length over-all, 60' 0"; length between perpendiculars, 54' 9"; beam, molded, 15' 0"; depth, molded, 6'0"; draft, mean on trial, 3' 6"; speed, mean on trial, 9.5 knots. She is of steel construction throughout, with checkered plate deck.

The propelling equipment consists of one 150 brake horsepower Sterling "Petrel" gasoline engine, running at 1800 revolutions per minute, and geared 3 to 1 to the propeller shaft. The propeller is 3-bladed manganese bronze.

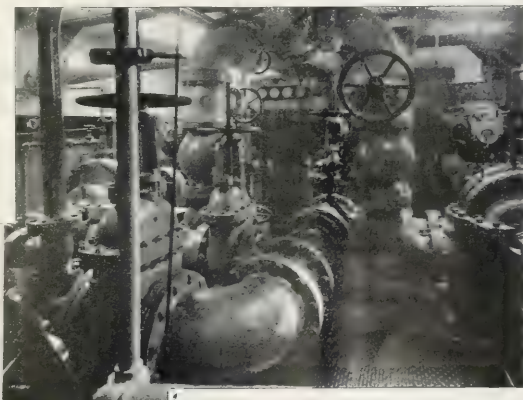
Pumping equipment consists of two 275 brake horsepower Sterling engines directly connected to 10- x 8-inch De Laval, 2-stage centrifugal pumps, each capable of handling 2600 gallons of water per minute against 120 pounds per square inch; or, when running in series, 2600 gallons per minute against 200 pounds per square inch. These pumps draw through two 12-inch sea suction,

either suction being available to either pump. The discharges run into a common 10-inch main, which distributes the water to the monitors and hose manifolds. By a convenient arrangement of valves, the pumps can be easily changed from parallel to series operation.

At each end of the mid-ship raised deck there is a 6-branch hose manifold. On top of the steel tower just aft of the pilot house there is a 6-inch monitor supplied by an 8-inch pipe. On the deck forward, a 4-inch monitor, and on the raised deck aft a 3½-inch monitor. The monitors are provided with an assortment of nozzles of varying

sizes.

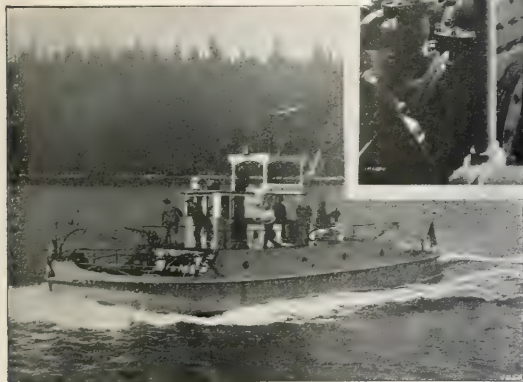
A compartment forward is arranged for the convenient stowage of 3000 feet of 3-inch fire hose. The hatch to this space is provided with rollers to allow the hose



Insert above: Fireboat J. H. Carlisle in action.

At left: J. H. Carlisle on speed trials.

At right: Interior of engine room, showing De Laval pumps and connections and Sterling engines.



to be withdrawn quickly without damage. Gasoline storage, about 750 gallons, is provided in steel tanks located in the after peak.

The vessel can be maneuvered from the pilot house, and a water screen is provided for its protection when close to a fire.

Very successful trials were held in Burrard Inlet on August 24. The

trials were witnessed by interested surveyors on the vessel and a number of invited guests on the Vancouver Harbour Commissioners launch Fispia.

At the launching the boat was christened by Miss Iris Gibbens, daughter of Alderman Gibbens of Vancouver, the name being in honor of J. H. Carlisle, veteran Chief of the Vancouver Fire Department.



Power hoist for boat houses.

Electric Hoist For Small Boats

A VALUABLE piece of marine equipment is now being introduced to small boat owners by the Monnier Brothers Machine Company of Algonac, Michigan, in the new Algonac boat hoist. The new machine is the only electric hoist on the market for raising small craft out of the water. The new equipment eliminates the back-breaking effort and time formerly spent by the boat enthusiast in raising or lowering his boat by chain falls or other equipment.

To operate the new device the owner merely drives his boat into the boat house, steps out, and touches an electric button. The boat rises gently to the proper position, the power is cut off, and the boat hangs in slings, safe from the buffeting of the waves and free from all danger of becoming water soaked. By means of the specially constructed braking attachment, the boat is lowered slowly and smoothly to the surface again.

The mechanism of the electric model power hoist consists of a cable drum, driven by gears from an electric motor, and mounted at one end of a wooden frame which may be easily constructed by the owner from the manufacturer's instructions. The model may be equipped with either chains and hooks for lifting rings, or with cross beams for a boat cradle. In either case the sustaining parts are supported by half-inch steel cable which winds on the cable drum.

The power hoist is adapted to three lifting capacities, according to the size of drum used: 8000 pounds with a 4-inch drum, and 6000 pounds with a 5-inch drum. The corresponding lifting rates are 11 inches and 14 inches per minute, the lowering rates 21 inches and 30 inches per minute, and the lifting ranges 9 feet and 10½ feet. Thus the device may be used for lifting craft varying in size from a

small rowboat to a power boat of the cruiser class.

The mechanism is driven by a Westinghouse one-quarter horsepower motor, which may obtain its power from any light socket using 110-220 volt, 60-cycle, single-phase, alternating current. The entire mechanism is completely enclosed in an oil-tight case.

The main bearings are fitted with

roller bearings, and the high speed bearings are of bronze. The main gears are cast iron, and all others are cut. All gears run in oil. The automatic clutch is centrifugally operated. The lock brake and governor are automatic in operation and positive in action. A hand hoist, operated by a wheel and crank arrangement but otherwise similar to the power hoist is also manufactured by the Monnier Brothers Company.

Floating Service Station

A FLOATING service station, equipped to completely service yachts, motor boats, or other types of craft with their oil, gas, and fresh water requirements has been established by the Union Oil Company in Santa Monica Bay at a point approximately three quarters of a mile from the Municipal pier. The oil company is utilizing its barge Coronado which is specially designed for this type of service. It will be in operation throughout the entire year, it was stated by J. C.

Wheeler, manager of the oil company's southern sales division.

The sides of the barge are fitted with smooth chaffing strips for the protection of ships while they are being serviced with their requirements. Four vessels can be fueled at one time. The barge is specially equipped to insure quick deliveries. It is fitted up with every modern convenience, including rest rooms.

The barge carries supplies of diesel oil, distillate, gasoline, lubricating oils, and fresh water.



Trawler No. 1 of the Martinelli Fishing Company, San Francisco, built by Madden & Lewis, Sausalito; 65 feet by 16 feet 8 inches by 8 feet; powered with a 3-cylinder 135-horsepower Washington-Estep engine installed at the Sausalito plant by W. H. Worden & Co. This craft is said to be the fastest fishing boat on San Francisco Bay, having made 12 knots on her trials.

Making the Safety Movement Attractive

By Herbert Hebermann,*
President, Export Steamship Corporation, New York

ON a vessel we do not have access to all facilities such as doctors, nurses, appliances, and ambulances, but nevertheless the seagoing personnel is amply protected and cared for. When an accident occurs or an illness develops at sea on a freight vessel, the master becomes the doctor and nurse. The master, to secure his license as master, must have passed certain medical examinations, so the patient is not entirely in the hands of an amateur.

"Safety practices" and the reduction of accidents and illnesses among the floating personnel have been uppermost in my mind, both as to the welfare of the men and efficient operation of the fleet. If our officers and crews were in perfect health before signing on for the foreign voyage, a great number of illnesses would be eliminated. To bring this about, we have established our own medical department, under the direction of an experienced physician. Each officer and man applying for a position must undergo a rigid physical examination to determine his fitness, and upon the doctor's recommendations the applicant is either accepted or rejected. The medical office was completely organized and began operation February 11, 1927. During the year 2246 examinations were made. Of this number 1686 were original examinations and 560 were examined one or more times. Employed on all vessels as of January 1, 1928, there were:

779 men who had 1 examination
303 men who had 2 examinations
131 men who had 3 examinations
55 men who had 4 examinations
8 men who had 5 examinations
1 man who had 6 examinations

Of the 2246 men examined, about 10 per cent were disqualified for physical defects; heart disease, color blindness, hernia, cataracts, poor vision, tuberculosis, dental cases. Dental cases were largely responsible for over 50 per cent of the disqualifications.

During the year 1926 our statistics show 135 cases of illnesses and 189 injury cases. In 1927 statistics show 151 cases of illnesses and 186 injury cases. These figures show an increase in 1927 over that of 1926 on illness cases of about 12 per cent, and a slight decrease on injury cases in 1927 as compared to 1926. The expenditures, however, for the same period show really what can be done by consistent effort. Those for 1927 were less than 50 per cent of those for 1926.

In order to instill in our organization the necessity of safety on the piers and aboard the various vessels, we created a safety committee consisting of the heads of the various departments vitally interested in the actual operation of the steamers and the pier terminals. This committee consists of seven members, who meet once a month to discuss safety recommendations made by members of the committee or any other individual of our organization. While the recommendations, in some cases, have been quite expensive, we have not as yet disallowed any expenditure applicable to the common safety on board steamers or in the dock terminals.

Each individual vessel in the fleet has its own safety committee consisting of the master, as chairman, chief engineer, chief officer, and chief steward. Meetings are

held during the voyage at the discretion of the master and the recommendations and minutes of these meetings submitted, upon the return of the vessel, to the committee ashore for disposition.

Now, having a healthy crew, through the efforts of the medical department, and having formed a committee on board ship so that the members of the crew could be taught to take care of themselves and be protected from accidents as far as was humanly possible to do so, we took the next logical step and created a "Safety-First Bonus Program."

To encourage the safety-first policy by men in the employ of the different ships, it was proposed that the vessel having the lowest expenditure for illnesses and injuries over a period of one year, which constitutes four consecutive voyages in our trade, would fly a "Safety Pennant," and all officers and members of the crew, who were part of the ship's personnel for that entire period would receive a bonus equal to two weeks salary, or a part proportionate to the number of voyages they made as members of the personnel of the successful vessel. In order for the ship's personnel to take advantage of this bonus system they must be in the employ of the corporation at the termination of the fourth voyage. This plan has worked out even better than we anticipated and has created a spirit of friendly rivalry amongst the personnel which has been of great benefit both to the employees and to the corporation. It has further reduced the medical and hospital expenses, reduced injuries, and has eliminated much loss in time by men engaged in a business which involves a certain degree of hazard.

Our safety-first scheme is somewhat a departure from the usual practice inasmuch as we have never engaged the services of a safety expert. This is in no way a reflection on safety experts, but was the result of very serious consideration on our part. The sea-going fraternity (particularly the "old salts") are very set in their ways and in many instances would resent suggestions from a person inexperienced in the ways of the sea. We, therefore, considered it better to use our own employees in developing our safety-first measures rather than to introduce a stranger. We inaugurated our safety-first campaign as a matter of education, and felt that this could best be put over as a gradual process rather than an attempt to revolutionize the existing practices in the steamship business. Our scheme has worked successfully, and many whom we regarded as difficult subjects have taken hold of the safety ideas with considerable enthusiasm.

We had to consider expenditures involved in developing this campaign, and as the steamship business, under the American Flag, has not been particularly lucrative in the past, we had to consider the financial aspect as one of the salient features. Therefore, we were not able to afford radical changes in design which involved a considerable expenditure, as all of our vessels were practically of the same type, and an expenditure on any one vessel meant a similar expenditure on the other twenty vessels of our fleet. We have had considerable assistance in the form of safety recommendations from outside persons, and have availed ourselves of literature and posters from the Marine Section of the National Safety Council.

*Abstract of paper read before the Marine Section of the National Safety Council at the New York Convention

Sea Wings

The Development and Standardization of Yacht Racing and Yacht Racing Associations

By James A. Quinby

DOWN through all the ages—including the present age of air navigation — there has been no form of transportation which compares in thrilling smoothness to the effortless drive of a water-borne, wind-driven hull. The free soul who plants his feet firmly upon a surging deck and hears the cracking of canvas above him feels a distinct sense of superiority, born of the realization that he is winging his way with the help of the elements in place of beating them by the application of power.

As a figure in ocean commerce, the picturesque sailing vessel, like the boys of the G. A. R., is passing on; but the brotherhood of oak and canvas has held its own in the ranks of pleasure craft. The small sailing vessel, and more especially the yacht (a term, by the way, derived from the German "jagen," "to chase"), has increased in numbers year after year, until many of our larger seaports have almost as many yacht clubs as golf courses. And it must be admitted that the similarity in the two sports includes a wide variety of rules to meet conditions on varying courses.

Yachting, as a sport, has naturally developed on its racing rather than its cruising side. The first recorded vessel of the type was the Rat of Wight, built at Cowes in 1588, which created such an interest that the King and Duke of York each built a yacht and staged the first race on the Thames in 1661. In 1720, the Water Club of the Harbor of Cork, the first yacht club, was established. Racing, however, did not become popular in England until after 1843, when Queen Victoria began offering prizes to competitors.

The New York Yacht Club, whose rules have been the model for a majority of similar organizations, was the first American club, having been founded in 1844 with an original membership of eight vessels.

Even in the infancy of the sport it became apparent that under almost any conditions a big boat could sail faster than a small one. Some form of handicap rules were accordingly necessary to classify and equalize racing tonnage.

The British, therefore, agreed to handicap large vessels by a certain number of seconds for each ton of difference in custom house measurements. The rule for such measurements was as follows:

Subtract the breadth of hull from the length of keel; multiply remainder by breadth of hull; that product by half the breadth, and divide the final product by 94.

This was fair enough at the time it was adopted, be-



Carrying canvas on San Francisco Bay.

(Photo by Walter Scott)

cause a hull was usually half as deep as it was wide. One element of measurement was early evaded by yachts of the Cygnet class (1846) which had their stern post and stem raked so as to give a maximum of waterline with a minimum of keel. The length was thereafter measured from stem to stern on deck, and since 1878 has been measured on the water line.

Because the above requirements assumed a depth of one-half the beam and thus taxed the beam twice and left the depth untaxed, designers began to pinch the beam and add to the depth and length. This developed the British cutter, which has been termed a "razor-boat" or a "plank-on-edge" type. It is easily seen that such craft could rate a limited tonnage under the old rules of measurement and still carry a tremendous spread of sail.

Realizing the absurdity of the old Thames Rule, the British Yacht Racing Association, in 1886, discarded it entirely, and substituted the simple formula of $L \times S.A. \div 6000$, which definitely recognized the spread of canvas as a controlling element in speed. The present measurement rule of the North American Yacht Racing Union is based on the formula:

$$0.18 \frac{L \sqrt{S.A.}}{3 \sqrt{D}}$$

There it is. The layman can take it or leave it. In plain language, it means eighteen per cent of the product of the length multiplied by the square root of sail area, divided by the cube root of displacement.

Measurement rules have now been standardized so that there are two recognized methods, one in England and one in this country. There are, of course, many variations in rules classifying individual craft under varying conditions. Certain types and sizes of yachts have been grouped into racing classes usually designated by letters, such as the "R" class or the "Q" class, and in these classes arbitrary limitations upon length have been imposed with a view to preventing freak boats.

The field of measurement and classification is not the only one in which the yachtsman has had to face the problem of developing an adequate and uniform set of rules. While racing yachts are, of course, in the category of seagoing vessels, the existing navigation laws have been universally unequal to the exacting demands of racing conditions. The International and Inland Rules (which in this particular are identical) indicate the privileged and burdened vessel in five situations involving relation of course to direction of wind.

A complete and separate set of rules has been devised to govern the conduct of racing yachts, involving the rights of vessels which are converging, altering course, overtaking, or engaging in other maneuvers, and prescribing the manner of passing and rounding marks and preventing obstruction of proper sea room.

During the period of development in the United States, the chief difficulty in connection with these details has arisen from the tendency of each club to make its own regulations, designed to fit its own boats under local conditions.

In November of 1925, some forty-odd yachtsmen from various sections of the United States and Canada met in New York and formed the North American Yacht Racing Union, for the purpose of standardizing racing rules and taking charge of events sponsored by member organizations. While the Southern California Yachting Association is a member of the Union, there

has existed up to the present time no similar organization for handling races in the San Francisco Bay area.

During the past season, however, the newly formed Yacht Racing Association of San Francisco Bay has come into being, and the majority of the 1928 races have been held under its auspices. In the San Francisco Bay district there are seven active yacht clubs—the St. Francis, Corinthian, San Francisco, South Bay, Aeolian, Oakland, and Vallejo. In the past these various clubs have arranged their races in much the same fashion as they arranged their dances. A committee was appointed to issue rules for the event and lay down the appropriate handicaps for entrants. There was no certainty that the members of the committee would be enthusiastic about their duties, and, as a result, the rules were often unintelligible and the competitor stood an excellent chance of going to the starting line without knowing what his handicap was to be. It is even whispered that certain handicaps were decided upon after the race was over.

While this slipshod method of handling races did no particular harm where the race involved only members of a single club, it bred extreme dissatisfaction where inter-club affairs were involved. As invitational regattas were held under the auspices of a single club, the clubs rotating in this respect, the committee in charge naturally changed with each race. As no standard set of rules was adopted by these committees, the system—or lack of it—resulted in confusion to participants and spectators alike.

It was to eliminate this confusion that the Yacht Racing Association was formed. The Corinthian and St. Francis clubs are the active members of the Association and are responsible for its organization, but its services are available to any boat owner in the San Francisco Bay district. The present officers of the Association, to whom credit is due for the successful conduct of the 1928 season, are Warren H. McBryde, chairman; Wilfred Page, secretary-treasurer; and Alfred W. Young, recorder.

The association is organized and exists solely for racing purposes and has no interest or control of the social or cruising activities of member clubs. As under the old system, races are sponsored by the individual clubs, but the actual details of issuing rules, starting times, and handicaps are handled by trained members of the association. Yachtsmen are thus enabled to have a complete schedule of races scheduled for their benefit at the opening of the season, with their individual handicaps definitely set well in advance of the race. They are assured that vexatious minor changes in rules will not be made from week to week and that correct results will be mailed to them immediately upon the completion of each race.

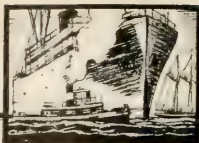
As the rules enforced by the Association are those of the North American Yacht Racing Union, contestants in all races are acquainted with exact rules under which the next National Regatta will be held on San Francisco Bay. The active cooperation of the United States Coast Guard has been secured to patrol courses and render assistance to those in distress, whether the distress arises from rocks, shoals, or the unwarranted intrusion of ferryboats.

In short, the Yacht Racing Association has taken a big stride forward in eliminating the rough spots in the cleanest and most thrilling sport in the world.



A close finish of an R-boat race, San Francisco Bay.

[Photo by Wilfred Young]



Trade, Traffic, and Shipping

Potential Trade of Far East

A Brief Survey of America's Commercial Transpacific Opportunities

By A. B. Bland Calder

United States Trade Commissioner, Shanghai.*

THE following is a brief survey of the Far Eastern countries vital to us in our future trade development. It is peoples, their number and characteristics, their resources, and the probabilities of their utilizing their resources to advantage that command our attention.

Japan

Japan has demonstrated to us the rapidity with which a Far Eastern nation can rise from a medieval to a modern state. Concentrated on a few islands off the North Coast of Eastern Asia, her people have been embracing and absorbing western ideas and things for 60 years. In that short period Japan has risen to the position of one of the world's four great military powers and has made such strides in developing industries, shipping, and trade, such advancement in modern education and scientific knowledge, that we must needs admire what she has accomplished thus far. With a land area of only slightly more than 147,000 square miles, or about the size of the State of Montana, with only one-fifth or less of that land area possible of cultivation, with comparatively small resources otherwise, and with her population now amounting to sixty millions, increasing at the rate of a million or more annually, Japan has an economic and social problem the like of which no nation has probably yet faced. Her further industrial growth and her economic progress generally must depend largely upon favorable developments in other Asiatic countries and upon her continued beneficial trade relations with the United States. Japan is our best customer among all the transpacific countries.

Our sales to Japan have grown since prewar figures from about \$44,000,000 per annum to considerably more than a quarter of a billion dollars annually, representing a six-fold increase; while our purchases, consisting largely of raw silk, run over \$400,000,000 a year, and are nearly five times as great as our prewar purchases from that country. The United States is Japan's best export market from a standpoint of value of export shipments.

China

With her man power and resources, agricultural and otherwise, China is in a position to become one of the richest nations in the world. At some time in the future, China will undoubtedly offer a much more attractive outlet for our surplus products of the factory and of the land than at present. China now ranks twelfth in importance to us as an export market, buying about the same value of merchandise from the

United States as do Belgium and Mexico. Among the transpacific countries, even now, China ranks third, following Australia in importance.

On the basis of population alone about one-quarter of our foreign trade should be with China. In actuality at present less than 3 per cent of our exports and imports are with that country. That small proportion of our trade is, however, no mean figure. We sell more than \$100,000,000 worth of our products to China and purchase \$150,000,000 worth or more in return annually.

Our current trade with China is five times greater than at the time the revolution broke out in 1911. I would hesitate to predict what the future will reveal. The immediate future is what interests us in our present considerations. 1927 was the first year in China's recent past when steady growth in foreign trade received a set back.

During the entire period of trade expansion the country has been intermittently upset with civil wars. But it is characteristic of China that where war or other disturbances may temporarily upset a certain area, the country is so large that trade may be flourishing and prosperity apparent in other sections. Indeed for practical purposes of our present calculations, we may regard political and military disturbances, and an occasional famine here or there, an entirely normal condition in China. It was because the disorders of 1927 were widespread and because of the accentuated antipforeign trend that trade suffered a drop in 1927. But despite that fact the decrease in China's trade was only roughly 15 per cent below the previous year's figures, which were the highest in China's history. With only these premises to go upon and without forecasting what may be the result of the current political movement in China, it may be assumed our current volume of trade will at least hold or that a slow but steady increase in China's foreign trade may be expected. Figures so far obtainable this year indicate a distinct rebound in Yangtze Valley and South China trade.

The Chinese business communities have assembled in conference and have threshed out many problems affecting business and have suggested practical programs to the politicians. The foreigners resident in the ports have mingled with the Chinese business and other communities more intensively and have discussed the issues raised. The American Chamber of Commerce, especially, in Shanghai has sought to improve business relations with the Chinese by getting together as frequently as possible with the Chinese bankers, capitalists, industrial plant owners, and merchants and dis-

*Extracts from a paper read before the recent convention of the Association of Pacific and Far East Ports, Los Angeles.

cussing the problems affecting Chinese and foreign business alike. Much good has resulted from these meetings, and a sympathetic chord has been struck which I believe will go far toward correcting the impressions the Chinese generally have obtained of us from the rabid anti-foreign propaganda circulated among the people. The Nanking Government as now constituted has expressed a desire to work out harmonious relations with foreign countries by negotiation gradually rather than forcing issues precipitately.

Philippines

The United States supplies 60 per cent of the imported products consumed in the Philippines. In 15 years the volume of sales of American goods to that island group has more than quadrupled, amounting last year to \$69,500,000. As a source of supply of raw materials, principally copra and coconut oil, the Philippines have grown steadily more important to us. A population now numbering 14 millions has been under the American flag for 30 years. Average expectancy would indicate that the future will show a normal growth in our trade relations there.

Except for the year 1920, when exaggerated values distorted normal trade calculations and made for abnormally large totals, Philippine foreign trade may be said to have shown a steady increase, reaching its highest level in 1927, when total exports and imports amounted to more than \$271,000,000. The demand for cotton textiles, iron and steel for building projects, machinery and equipment for sugar and lumber mills, electrical power stations, and refrigeration plants has in the past created favorable markets for our products in this island group. Consumption of canned goods and California fruits is reported to be increasing and economic factors in the Philippines generally point to continued and increasing prosperity there. Continually larger motor car importations now running to about 4000 cars per annum and growing road mileage are healthy indications of prospects for future automobile sales.

French Indo-China

Due to the French tariff applied in Indo-China, the opportunities for the sale of certain American products are not as great as in other parts of the Far East; in fact, French automobiles predominate in this district. Due to laws requiring predominance of French capital in industries, expansion in rubber growing and other industries capable of development in that region is perhaps not as rapid as might be the case were the country thrown open to foreign capital generally. But on the whole, conditions there are indicative of the extent to which the peoples of South Eastern Asia are absorbing modern transportation, modern goods, and western commodities. Modern agricultural methods are capable of development in this region and there were already indications that tractors and other implements have at least been introduced if not as yet extensively used.

A study of the resources and developments in Indo-China generally indicate that the surface has only been scratched so far as mining activities and industrial development are concerned, and that further growth in modern transportation will do much to enrich the whole area which is about three times the size of England, Scotland, and Wales combined. Inland water transportation is already an important factor in the matter of transportation. The chief occupation and source of wealth is rice growing and export. Twenty million people live in French Indo-China.

Siam

Siam is about approximate to France in area and has a population of slightly under 10,000,000. While our present sales to Siam are only a little greater than \$2,000,000, this is two and a half times greater than in 1914. Even the conditions in the interior of the country are still primitive and rice growing and export is the chief occupation and principal economic resource. Siam's sales of tin and teak lumber add a substantial factor to her purchasing power. A progressive government with foreign educated heads is endeavoring to work out a program of government economy, increased rail and highway transportation, and the encouragement of cooperative movements among the producers. Matters of education and sanitation are assuming continually greater prominence, special attention is given to the comfort and welfare of temporary visitors to the country, and we may expect a steady growth of our trade with Siam under the encouraging conditions prevailing there.

The Dutch Indies

The Dutch Indies, with 50,000,000 or more inhabitants, comprising the huge islands of Java, Sumatra, Borneo, and the Celebes, and numerous smaller islands and groups has been rapidly developing in importance to us as a market for American products and a source of supply of those raw commodities essential to our industries. Our actual shipments to this area have increased about six fold since the beginning of the great war. Automotive products form our chief item of sale, amounting last year to more than \$8,000,000 in value, and a wide range of both manufactured and staple commodities and foods makes up an attractive total of \$32,500,000, representing our last year's trade. Our canned salmon, sardines, and milk, as well as canned meats, fruits, and vegetables, and wheat flour are increasing in demand in the Netherlands Indies and can be marketed in competition with Australian products of the same nature; while fertilizers, iron and steel, petroleum products, machinery, rubber tires, tobacco, and numerous other of our lines find a ready market in that territory.

Our current automobile sales in the Netherlands Indies run to a thousand cars or more per month, and an American assembly plant established at Batavia reports double the business originally estimated as possible for its first year of operation.

Profits to small growers of rubber have in the past tended to enrich the native population as well as stockholders abroad in large Netherland Indies plantations, and, while an element of caution prepaals at present in the rubber producing countries generally, there is reason to believe that any depression will be temporary.

India

There has been a steady increase in our trade with India. We can recount a six fold advance in our sales since 1914, the volume now running to more than \$63,000,000 on the basis of 1927 trade statistics. We shared in India's purchases to the extent of nearly 9 per cent last year. Of course, Indian trade with the British Empire predominates; but our sales in India exceed those of any other country except Great Britain.

While one is amazed at the backwardness of these masses of India's population and at the primitive manner in which the majority live, one cannot help but be forcibly impressed also with modern industrial developments, and the rapidity with which western merchant

(Section continued on Page 27, Blue Section)

Sea Ports and Air Ports

An Analysis of the Factors Governing Planning of Airports and the Advantages of Having Seaboard Airports Under the Control of Seaport Governments

By James H. Polhemus,

General Manager and Chief Engineer, Port of Portland, Oregon.*

COMMUNITIES on the Pacific Coast have always been willing to confer broad powers on their port organizations. Such organizations often hold large areas of tidal lands suitable for airport development and reasonably close to business centers. It seems natural that air and sea transportation should unite, and the seaport authority provide the airport facilities. This is being done on the Pacific Coast at Oakland, Los Angeles, and Portland.

The theoretical requirement for the ideal airport is one square mile in size, but this is not at all necessary, and I know of no city where such a large area is used. I think, however, that the minimum area for practical purposes should be at least 100 acres and that area free from bordering obstructions so that planes could actually use the entire dimensions. By this I mean that if planes may safely fly at low altitudes outside the airport boundaries and thus be able to utilize the full dimensions of the field surface as runway, a field with dimensions of about 2000 feet or slightly less would serve and such a field would contain only about 100 acres. Where bordering obstructions exist the field dimensions must be much greater so that a plane will have sufficient altitude at the boundaries to clear the obstructions. Freedom from such obstructions is one of the best features of the port airports at Portland, Oakland, and Los Angeles, all being more or less surrounded by water.

The approximate area of the Oakland airport tract is 825 acres. It is on low lying lands bordered by an arm of San Francisco Bay. At this time only a portion of the surface has been placed in condition for use of planes. Our information at the time of writing is there is 61.2 area about 1800 by 2500 feet and another about 7000 feet long, and from 600 to 300 feet wide in serviceable condition, and these serve adequately.

The proposed airport to be developed by the Harbor Commission at Los Angeles is on Terminal Island. The initial plans contemplate development of about 97 acres, providing runways 2000 feet long. Later development of a total of 185 acres is planned.

I am unable to give costs or greater detail as to the port airports at Oakland and Los Angeles, but can give some details concerning the Port of Portland airport that may be of interest.

The Port of Portland has been fortunate in being able to provide the community with a Class A airport at a very small outlay of public money. The Port of Portland airport tract contains about 253 acres, made up of a main landing field 1220 feet by 6700 feet, extending out into the Willamette river; a filled causeway to the mainland, 270 feet wide, and an area on the mainland 550 feet by 1200 feet, the latter space being for approach, parking space, and industries related to aviation. The main field has its long dimension up and down stream, parallel to the prevailing winds and is entirely free from bordering obstruction. In fact, it is

surrounded by water except at the causeway connection. Between this field and the east mainland, there is a body of fresh water 700 feet wide and about 1½ miles long, known as Swan Island basin. This makes an ideal port for hydro-airplanes as it is free of currents, drift, or any obstructions, and is essentially a part of the airport itself.

The land on which the airport is situated was formerly known as Swan Island, and was a low lying timber covered waste. It was acquired by the Port of Portland several years ago at a low figure as an incident of a harbor improvement project so that a part of it could be dredged out to straighten and widen the harbor area. It was only recently, when the demand for an airport became insistent, that the use of the remaining portion of the island for that purpose was decided upon. After felling the timber, the island surface was raised about 20 feet by deposit of material dredged in improving the harbor. A permit was secured from the federal government allowing the port to fill also a causeway across the old east channel, and thus a connection was made to the mainland. While filling was in progress it was possible, with the hydraulic pipe line dredges, to leave a level surface. It also proved feasible to flow a top layer of clay and silt over the sand which composed the body of the fill and thus a top soil suitable for growing a grass sod was secured. Suitable grasses were immediately sown and an excellent sod was obtained within six months. The nature of the soil, with the imperceptible crown given to the surface has taken care of drainage naturally without it being necessary to expend any money for artificial drains.

The airport lands abut upon a main arterial street and lie only 3½ miles from the business center of Portland, which embraces about 67 square miles within its boundaries. Ten to twelve minutes is the time required to reach the airport from the Post Office or Union Station by auto, including all ordinary traffic delays, and it is also reached by street car and by boat if desired. It is at about the center of the developed harbor area of Portland which extends along some 11 miles on both sides of the Willamette River. The harbor area or fairway along the westerly side of the airport is 1500 feet wide with a depth of 35 feet at low water.

So far all of the cost is chargeable to the harbor improvement or to real estate. Even the cost of seeding the area could be so charged, as it is very desirable that the land have a surface other than sandy soil, which would drift and blow about as well as being unsightly.

A roadway is being built to give access from the nearest street, and this too is properly chargeable to the value of the land. In fact, the land would show a value of not less than \$5000 per acre in an appraisal and, as industrial, waterfront land, its value should rise quickly above that figure. The cost to the Port of Portland for this land, including original purchase at \$450 per acre, the pro-rata cost of filling, seeding,

*Abstract of paper read before the Fifteenth Annual Convention of the Association of Pacific and Far East Ports, Los Angeles, June 20.

and roadways will not even reach \$2500 per acre, or half of its present land value. Under this state of facts, one can say that the airport site cost the public nothing.

The Port of Portland Commission is proceeding on the theory that while it devolves upon the municipality to provide a landing field in condition, safe and accessible for planes, it is not under any obligation to furnish the service facilities without reimbursement. We have favored minimizing the public investment in facilities, but in the present stage of development it appears impracticable to require operators to provide their own service buildings. The Port will, therefore, provide hangar space but will endeavor to secure such rentals as will enable it to amortize construction costs in not over 10 years.

My general impressions gained after visiting airports throughout the United States might be summed up in these viewpoints:

1. That the airports in the larger cities are so far from the business centers they are not convenient to use; their existence was not generally known; and the business they were carrying on was not fully understood by the public.

2. That the activities of the airports were not self-sustaining, and no doubt will be a community expense for several years.

3. Though the airport tracts generally comprised large acreage, only a relatively small portion was being used. In many cases the larger tracts were purchased with the view of being able to offer factory sites to the manufacturers of airplanes and airplane equipment.

4. That development in aviation has been so great in a short space of time that many of the airport service facilities which seemed adequate when built have quickly been outgrown.

5. That the construction of and drainage of suitable runways was an involved and expensive problem. Cinder runways were generally found in the East, but they were not entirely satisfactory and the maintenance expense on them was heavy.

6. That grass turf landing fields were considered the most satisfactory, but that in most localities the expense of keeping them in condition would preclude their use. Also in many instances they are impracticable on account of climatic and soil conditions. They are nowhere found practical for heavy passenger planes.

In this early stage of development of commercial aviation we have felt it unwise to make large investments ourselves and we consider it equally unwise for operators to do so. We, therefore, will be satisfied with inexpensive structures so long as they are neat in appearance and present no hazards to life or property. Under this plan these buildings would serve until such time as the need for more pretentious buildings arose, which would not be until aeronautical activities had taken a definite place in the transportation scheme of the country and were producing an income which would justify an investment in permanent substantial buildings. We also have in mind that types of airplanes have not been standardized, at least so far as dimensions are concerned, and new structures built to accommodate planes of today might be entirely obsolete in a short time. The principal thing that the municipality is, under present conditions, obliged to do, is to provide a safe, accessible field and to retain such control that all branches of aviation may be accommodated without conflict.

American Association of Port Authorities

THE American Association of Port Authorities holds its Seventeenth Annual Convention in Houston, Texas, November 12, 13, and 14, and, and in Galveston, November 15. An excellent program has been prepared covering papers on very important subjects by the more notable port and shipping experts of the United States and Canada. In addition to these papers, there will be reports from the standing committees composed of the more prominent port executives of the United States for the past year studying diligently such subjects as port research, the relation of ports to national defense, fire protection, port legislation, admiralty jurisdiction, oil pollution, and port finance.

The Pacific Coast is well represented in the program, by four papers out of a total of 13. James H. Polhemus, general manager of the Port of Portland, has a general paper covering the problems of the Dredging of a Modern Port. George Handsul of the Vancouver Harbor Commissioners, presents a paper on The Pacific Northwest. R. G. McGlone will discuss The Development of the Port of Long Beach, California. Shelby Wiggins, who, although now resident in Texas, will always be a Pacific Coast booster, will tell the convention about The Public-Owned Terminal as a Factor in the Development of Trade.

An interesting schedule of excursions has been arranged, including the trip of the whole convention on November 15 from Houston to Galveston by special interurban trains. At Galveston, there will be a thoroughgoing inspection of that very interesting harbor, and its port warehouses and terminal system.

Electric Arc Welding Demonstrations

WELDING in ship construction has been coming rapidly to the front as a possible means of reducing cost and improving the construction in steel ships. Ship builders and others interested in marine construction will therefore be glad to know that the General Electric Company and other pioneers in electrical welding have arranged a lecture and demonstration tour for Professor Frank P. McKibben, who has had wide experience in the application of electric arc welding to the noiseless construction of buildings. Professor McKibben's lectures and picture demonstrations will be given under the auspices of various American engineering societies. His Pacific Coast itinerary will be as follows:

January 18: Los Angeles, American Welding Society.

A.S.C.E.; A.I.E.E.; A. I. Architects;

January 22: Sacramento, A.S.C.E., Architects and Engineers Club.

January 23, 24, 25: San Francisco, A.I.E.E., A.S.C.E.

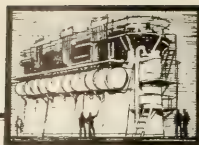
January 28: Portland, American Welding Society, A.S.C.E., A.I.E.E.

February 1: Victoria, Engineering Institute of Canada.

February 4: Vancouver, Engineering Institute of Canada, A.I.E.E.

February 6: Sookane, Spokane Associated Engineers A.S.C.E., A.S.M.E., A.I.E.E.

February 12: Seattle, A.I.E.E., A.S.C.E., A.S.M.E., A.I.A.



In the Engine Room

Mechanics For Marine Engineers

Part III, A Typical Problem In Statics

By A. L. Becker

IN the two foregoing installments of this series we have dealt with principles and definitions. Now we come to the application of these principles and the practical use of our definitions in the solution of practical problems. The writer will be very glad to take up any difficulties that may arise in the working out of these problems and endeavor to help the reader to a clearer understanding of the subject.

In Fig. 1 assume a bar A, B, acted upon by three forces (or loaded with three weights) F_1 -40 pounds, F_2 -20 pounds, and F_3 -90 pounds all acting or placed at $1\frac{1}{2}$ feet, 3 feet, and 4 feet, respectively, from the left hand end of the bar, which bar is 6 feet long. Also assume that the bar weighs 20 pounds and that it is of uniform size and density throughout its length. The center of weight of this bar will be at three feet from either end. The bar alone will balance over a knife edge at this point. This particular point is designated in mechanics as the Center of Gravity of the body. Therefore, the force F_c =20 pounds may represent the weight of the bar in the following considerations.

To determine the condition of equilibrium of this bar, or body loaded with forces or weights as indicated, we will apply the three conditions of equilibrium.

First, the sum of the moments about any selected point shall be zero.

For convenience take moments about A keeping in mind the direction of the moment tending to produce rotation about the point chosen A whether clockwise or anti-clockwise, right hand or left hand rotation.

The moment of F_1 about A is $40 \times 1\frac{1}{2} = +60$ ft. pounds
The moment of F_2 about A is $20 \times 3 = +60$ ft. pounds

The moment of F_3 about A is $90 \times 4 = +360$ ft. pounds

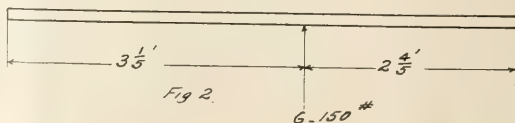
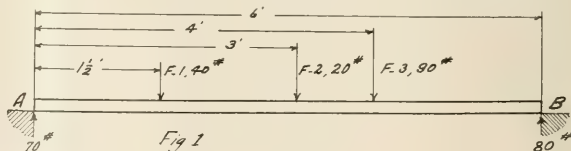
Total positive moments 480 ft. pounds

Assume, as a first consideration, that the bar is supported between the two points A and B, and that it is desired to determine the load on these points or the force which must be applied to the points A and B to equalize the forces F_1 , F_2 , and F_3 . As the combined moment of these forces about A is 480 foot pounds as above, recalling that the sum of the moments about any point must be zero for equilibrium, this negative moment must be 480 foot pounds and as the distance between A and B is six feet, the force at B must be $480 \div 6 = 80$ pounds. Therefore, the reaction or load on the support B from the forces (F_1 , F_2 , and F_3) is 80 pounds. The sum of the F forces is $40 \text{ lbs} + 20 \text{ lbs} + 90 \text{ lbs}$, or 150 lbs., therefore, the reaction at A must be 150 pounds minus 80 pounds, or 70 pounds, in order that the second condition of equilibrium be fulfilled; namely, that the sum of the vertical forces shall be zero.

The bar is now in equilibrium, its load as indicated producing a reaction on the point of supports of 70 pounds at A and 80 pounds at B. As there are no forces acting in a horizontal direction, the three conditions of equilibrium are satisfied.

As the foregoing problem is typical of all problems, in statics it is very important that the principles of moments be thoroughly understood and made a part of a mechanical training by sufficient use and application. A machinist does not learn to use a hand hammer and chisel by reading about the operation.

To further amplify the principles in the above prob-



With this installment of his series on Mechanics for Marine Engineers, Mr. Becker begins the application of the principles, stated in the first two chapters, to practical problems often found aboard ship.

Mr. Becker will be very glad at any time to elaborate on any of these problems or discuss the solution of special problems with any marine engineer.

lem, take moments about the point B to find the loads on the supports or the reactions at A and B.

The moment of F_1 about B is $90 \times (6-4) = -180$ ft. lbs.
 The moment of F_2 about B is $20 \times (6-3) = -60$ ft. lbs.
 The moment of F_3 about B is $40 \times (6-1\frac{1}{2}) = -180$ ft. lbs.

Total counter-clockwise moment -420 ft. lbs.

To balance this moment the reaction at A must produce a clockwise moment of plus 420 foot pounds and as the distance of this force is 6 feet from B the value of the force must be plus $(420 \div 6)$ or 70 pounds as previously determined, and the reaction at B is $150 - 70 = 80$ pounds.

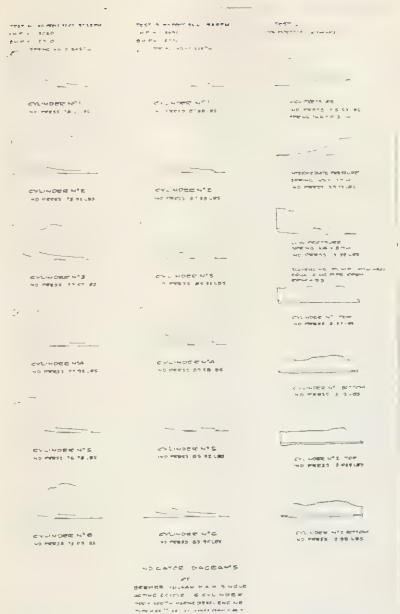
Further, discard for the present the reactions at A and B of 70 pounds and 80 pounds, respectively, and determine the location of a point where the bar will balance under the system of forces, as in Fig. 2. The sum of forces F_1 , F_2 , and F_3 is 150 pounds, which must be the value of the reaction at the point of balance. From previous considerations the sum of the moments about A is plus 480 foot pounds.

To satisfy the conditions for equilibrium, the sum of the vertical forces must be zero; and also the sum of the moments about a given point must be zero; therefore, the negative or anti-clockwise moment about A of the force which balances the system must be -480 foot pounds. As the force is -150 pounds the distance from A, to produce the moment of 480 foot pounds, is $480 \div 150$, or $3-1/5$ feet. Similarly the moment about B (-420 foot pounds) is divided by the force of 150 pounds will produce a distance from B of $2-4/5$ feet. Many other proofs of equilibrium may be had by selecting various points on the bar as a source or origin of moments, and it will always be found that the sum of the moments tending to produce right hand rotation of the bar will be equal to the sum of those moments producing left hand rotation. It is to be noted in the sketch Figs. 1 and 2, that two sets of supports are shown at A and B of 70 pounds and 80 pounds respectively, the forces necessary to support the bar at its ends. Also note a force of 150 pounds located at $3-1/5$ feet from A and $2-4/5$ feet from B which force is placed in the position indicated to balance the bar.

Refer again to Fig. 2. To check the balance let us take moments about the point of application of the 150 pound force. The only forces active to produce moments are F_1 , F_2 , and F_3 . The force G has no moment as the origin of moments passes through G, the distance of G from the origin of moments is zero; therefore, the moment of the 150 pound action is 150 by zero, or zero. It will be noted that when convenient the calculation is simplified by taking moments about an axis passing through a force or through one of the reactions. Returning to the problem, the moment of F_1 about G is clockwise and is equal to $90 \times (2-4/5 - 2)$, or $90 \times 4/5 = +72$ pounds.

Moment of F_2 anti-clockwise $20 \times 1/5 = -4$ ft. pounds	
Moment of F_3 anti-clockwise $40 \times 17/10 = -68$ ft. pounds	
Total negative moments	-72
Total positive moments	+72
Sum of moments	00

Therefore, the bar and weights will balance at the point G. This solution therefore checks the location of the point G by the previous calculations.



Here is a very interesting reproduction of indicator diagrams from the power cylinders, air compressor cylinders, and scavenging pump cylinders of one of the 6-cylinder, single-acting Bremer-Vulcan M.A.N. engines installed on tankers for the Standard Oil Company.

Errata

In Part II of Mechanics for Marine Engineers, Page 460 of the October issue of Pacific Marine Review, the make-up man in our printing plant caused a hiatus in the stream of logic which we hope was not too distressing to our readers.

The two lines at the top of the third column on page 460 should have been inserted as the fourth and fifth lines in the first column of Page 461.

Another error, not typographical but of fact, was called to our attention by a marine engineer as appearing in the article describing the airplane carriers Lexington and Saratoga.

The statement is made on Page 468 of the October issue that "the Saratoga, built in the Camden plant of the American Brown Boveri Electric Corp., is identical to the Lexington in every respect." On the same page it is stated "the steam necessary to develop the power required is furnished by sixteen water-tube Yarrow type oil-burning boilers."

The truth of this matter is that the Saratoga is identical to the Lexington in every respect except her boilers.

The Saratoga has an equipment of sixteen Babcock & Wilcox water-tube oil-burning boilers and the Lexington has the Yarrow type boilers as built and installed by the Fore River Plant of the Bethlehem Shipbuilding Corporation, Ltd.

A Scotch Chief Saves His Lay

WHILE this happened many years ago, the incident may serve to show that resourcefulness is a virtue and an asset when breakdowns occur at sea. The chief who saved the day is still living, but being a very modest man, does not wish his name to appear.

The steamer was a small one of about 600 horsepower. She was in the fishing trade, carrying cargoes of freshly caught fish from the grounds to a market on the East Coast. She had no refrigeration plant, as normally the run home was made in eighteen hours, the fish being stored in bins on deck and in the small after hold. Runs were always made in the night, leaving the Banks at about noon to catch the morning market in the city. For many voyages she had done this work and never failed to bring in her load, the engines always holding up well, keeping an average speed of around 12 knots.

The boiler was of the Scotch marine type, with a "dead-weight" loaded safety valve. That is, the weight holding down the valve was composed of 8 or 10 disks of lead, about 10 inches in diameter by 1 inch thick placed over a vertical stem. Three or four extra weights were carried, which was fortunate, as this story will show.

The engine was compound, with the conventional valve stem passing through the slide valves, secured by adjustable jam nuts; but she had no valve stem guides, the neck bush and gland took all side thrust with no extension of the stem to an upper guide; so when the upper nuts of the valve stem loosened they could slip off the top of the stem and jam. And this is just what did happen; with the result that the stem, about an inch in diameter, caught on the up stroke and bent, throwing the whole engine out of commission. Being only a fish boat, she had no tools on board, barring a hammer, a couple of chisels, a file, and a vise. But the old chief, a canny Scotchman, who while not brilliant was clever, at once ordered the fires lessened (we burnt coal), stop valve closed, and with his assistant, there being but two engineers and two firemen, commenced to strip the valve chests, the high pressure rod being the one bent. The curve in the bent rod was found to be quite pronounced; but fortunately there was sufficient slack in the neck bush to

allow the stem to be pulled down after the links had been disconnected. It had to be made straight in a hurry, and the chief, after replacing the lower nuts, stuck the threaded bent part of the stem into the glowing coals of the banked fire in one furnace.

While the rod was heating to a dull red he fished out from under a shelf two of the spare safety valve lead weights and, opening up the vise, placed the disks between the jaws, opened up enough to let the now hot stem enter. With the two

of us busy, and a fireman to steady the lead disks, we got the stem in between and set up on the vise. The lead being soft did not hurt the threads, and we soon had a fairly straight stem. It was hurriedly put together, we handling it while rather hot.

The high pressure engine was put on top center and the valve was roughly set; meantime the fireman had got fires away, covers were put on, and away we went, driving her hard and made the fish landing wharf only a few minutes behind schedule time, thus saving the catch and the "lay" for every man in her crew.

Analyzing Economy

By Renwick Z. Dickie

WHEN speaking of an economy effected by a change in propellers it is usual to elaborate on the economy in fuel and the increase in speed.

In May 1928 a new cast iron propeller was fitted on the steamship Costa Rica of the Alaska Salmon Company of San Francisco, and, as she carried many paid hands to the Nushagak River Cannery in Alaska, the principal economy effected was by her saving in time, the men she carried being paid by the day.

The Costa Rica was built by John Roach in Chester, Pennsylvania, in 1901, for the old Pacific Mail

Steamship Company to operate between Central American ports as a feeder for the larger ships carrying freight and passengers. She is 221 feet long, 36 foot beam, and 19 feet 3 inch depth of hold.

Her engine is triple expansion 20 by 32 by 50 inches by 36-inch stroke, with four Scotch boilers burning oil. She formerly made 10½ knots on four boilers; but can now do twelve using the same amount of fuel a day.

The ship left San Francisco May 15, 1928, for Nushagak River on the Bering Sea, but encountered such heavy weather on the trip north



Alaska Salmon Company steamship Costa Rica loaded with fishermen en route to Alaska.

that she was slowed down as she was loaded very deep and had two launches on deck. While in the Bering Sea a speed of 11¼ knots was made with three boilers. With four boilers 12 knots can be made in smooth water.

Through the courtesy of C. P. Hale, president, and J. F. Hidzick, superintendent of the Alaska Salmon Company, the tabular statement herewith was taken from the books of the company and log of the vessel and shows at a glance that

Nushagak River to San Francisco

	Old Wheel	New Wheel
Days steaming	9½	8½
Cost of fuel oil used	\$1282.50	\$1147.50
Total wages of ship and cannery crew per trip	1605.75	1427.36
Total cost of meals per trip (106 men at \$1 a day)	1007.00	901.00

Total fuel, wages, and meals per trip	\$3895.25	\$3475.86
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New System of Detecting and Extinguishing Fire

A SPECIAL demonstration of a new system of smoke detection used in conjunction with a means of freezing fire was held recently for the benefit of the United States Steamboat Inspection Service at the plant of the General Carbonic Company in Long Island City. Dickerson N. Hoover, Supervising Inspector General, Washington, D.C.; Captain Nils B. Nelson, supervising inspector, Ninth District, Cleveland, John L. Crone, supervising inspector, Second District, were present, as representing the Steamboat Inspection Service.

A series of twelve tests was made, using Fyre-Freez hand portable extinguishers in extinguishing fires of all sorts. The Fyre-Freez gas is ejected as a carbonic snow at a temperature 110 degrees below zero. Its effect upon the fire is that of smothering and its extinguishing properties are nothing short of marvelous. The standard underwriters' tests for portable extinguishers were completed in a highly satisfactory manner.

In the plant of the General Carbonic Company, covering the main compressor building, the shipping department, and the plant offices, there had been installed a complete system of smoke detection, based on the recently granted Marr patents. This system was installed in a manner to imitate as closely as possible an installation aboard ship. It consists of the necessary blowers for drawing samples of air from each protected compartment, through unit detectors, one for each com-

partment, located at the manifold stations where the extinguishing medium is turned on, and a series of master detectors that may be installed not only in the pilot house, but in additional locations such as the engineer officer's stateroom and the radio room.

A number of acceptance tests were made with the following results:

Test No. 1—Detection of a small quantity of smoke (one puff from a cigarette) was directed at a smoke collector 80 feet from the unit detector. This smoke was indicated at the unit detector within 7 seconds.

Test No. 2—A small amount of smoke continuously drawn into the same smoke collector was indicated at the unit detector within 8 seconds and at a master detector located 80 feet from the unit detector in 16 seconds. This small amount of smoke, created by means of burning joss sticks, was visible to the eye in the unit detector at a distance of 50 feet. At this distance the smoke was sharp and distinct and was clearly unmistakable. At a distance of 100 feet it could be seen, but was not quite so distinct. The smoke in the master detector, the instrument especially designed for installation in the pilot house, was clear and distinct at 25 feet. In addition the odor of smoke was readily detected at both unit and master detectors.

Test No. 3—A special fire test house had been constructed on the waterfront of the General Carbonic plant, approximately 200 feet away from the building in which the instruments were located. To reach this fire test house, a run of ¾ inch galvanized iron pipe had been made with six right angle bends, making six changes from the vertical to the horizontal and vice versa. A small amount of smoke from a burning rag was detected in the unit detector in 52 seconds and in the master detector 8 seconds later.

Test No. 4—A fire of burning oil-soaked rags, gasoline, etc., was started in the fire test house. The smoke and flames immediately filled the building. After a period of two minutes, Mr. Hoover directed that the Fyre-Freez extinguishing medium be turned on. Within 30 seconds the fire was entirely smothered by means of the carbon dioxide gas being carried through the smoke pipes and ejected directly within the closed building. After a period of three minutes, the doors of the building were opened, the fire was found to be entirely out, and the room filled with carbon dioxide. Upon returning to the detector instruments, the system was found to be in continuous operation, and without the movement of any valves, the carbon dioxide was being drawn back again into the instruments and was clearly shown at both unit and master detectors. For the extinguishing of the fire in the fire test house, a battery of six 40 pound cylinders of the Fyre-Freez extinguishing medium had been provided, located at a distance of 50 feet from the unit detector and valve manifold. By the operation of one valve only at the unit detector, the Fyre-Freez is turned on, a unique and specially designed check valve preventing any of the extinguishing medium from entering the smoke detection indicators.

In addition to the special committee from the Department of Commerce, as noted above, the United States Shipping Board was represented at this demonstration by H. M. De Graw, assistant naval architect. The marine office of America was represented by R. F. Sandberg, I. H. Osborn, chief electrical engineer of the Federal Shipbuilding Company; A. J. Conte and C. Nelson, Western Union Telegraph Company; Chief McKenna, 14th Division, New York Fire Department; W. R. Jungbluth, electrical expert aide, United States Navy Yard; J. E. Campbell, electrical expert aide, United States Navy Yard; N. E. Miller, W. S. McKleigh, J. Duffy, New York Edison Company.



Auxiliaries-Ship Supplies-Marine Equipment

Unusual Uses of The Gyro-Compass

MOST people in the marine world are aware that the true North accuracy and dependability of the Sperry gyro-compass have made it standard in all the navies and in over one hundred lines of the merchant marine. These applications range from battleships down to destroyers and submarines, and from giant liners down to tugs.

Two somewhat special uses, however—on train ferries and on a dredge—are apt to excite curiosity as to the reasons for their use in these fields.

The Southern Pacific Company has had its big ferries Contra Costa, largest in the world, and the Solano equipped with gyros for four years. The run from Port Costa to Benicia, across Suisun Straits on San Francisco Bay, is only three-quarters of a mile; but swift currents and heavy fogs make a compass necessary.

When two locomotives and a train of steel coaches come aboard, the magnetic compasses change as much as 5 points (56°) and become so sluggish that the ship may swing 1 to 1½ points before the card answers. Previous to the installation of the gyro-compass, much time was lost splitting up trains and arranging them on the ferries so as to least affect the magnetic compasses. The delay ordinarily took from one-half to one hour, and sometimes two trips were made for one train. Now no time is lost, and the ferry is loaded to capacity, regardless of the weather. The slips are over a thousand feet long; the captains locate the entrance by the piling, line the boat up exactly on the gyro heading, and enter with good speed and rudder control, with assurance of making a proper landing; although to enter the slip at any great speed steering by magnetic compass, when the swinging motion of the ship is not accurately shown, has often resulted in the boat jamming and tearing away considerable piling.

The gyros on these two boats have operated without interruption since installation, except for a few days at a time when the boats have been laid up for repairs. The gyro wheel on the Solano ran for over ten months without stopping, the monthly cleaning and oiling being carried out without interruption to the equipment.

Gyro-Compass Helps Build Chicago's New Park

The diesel dredge New Jersey of the Great Lakes Dredge & Dock Company, equipped with a Sperry MK. VI gyro-compass, is at present engaged in the work of making land for Chicago's lakefront park system direct from the bottom of Lake Michigan.

This dredge, the largest diesel dredge yet built, is over 250 feet long and has a 50 foot beam. Power for all machinery, cutter, hoist, main pump, and auxiliaries is furnished by four 1150 brake horsepower Busch-Sulzer diesel en-

gines which drive four 800-kilowatt General Electric generators at 180 revolutions per minute. The New Jersey, with her 30-inch pipe line, cuts from 850 to 1200 cubic yards per hour, depending upon the nature of the material, and delivers to a point two miles away from the dredging location.

The gyro-compass is a valuable asset to the New Jersey, as the weather at this season often forces her to leave the dredging location. Before getting the gyro it was difficult to get back in the same position and resume operations in the same cut, but now no time is lost in this way. This feature alone means a great saving.

The main purpose of the gyro-compass, however, is in swinging the dredge when making a cut. This swinging is accomplished in the following manner:

At the stern of the dredge are two tall pillars, one on the port side, the other on the starboard. These are called spuds. They weigh many

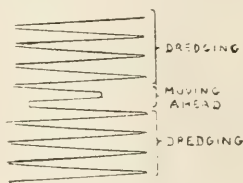
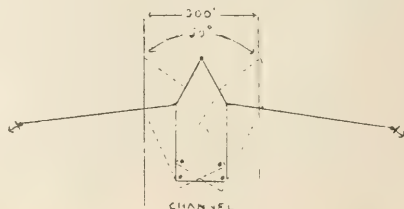


FIG. 1

The record on the Course Recorder left by these movements is similar to that shown in Fig. 1. The Densany is thus provided with an adequate check on their dredging operations and can figure out just what yardage the dredge has cut each day.

Fig. 2, below, shows how the dredge is pivoted on the spuds while cutting a channel 300 feet in width.



tons and are used as pivots in swinging the dredge by anchored hawsers from the bow. By swinging a certain number of degrees, say 50, a cut 300 feet wide is made. The depth of water is at

present about 20 feet and this is dredged down to 40 feet. In working ahead, the spuds are set down alternately at the end of a lesser swing so as to move the dredge ahead just seven feet.

San Francisco's Pioneers in Rope Making

IN the early days of San Francisco, when the bay was largely covered with sailing ships from all quarters of the world, there sprang up very naturally a large demand for good cordage, particularly in those days when a voyage to San Francisco from any European or Atlantic Coast port was a matter of three months at the very best and an average of between four and five months each way. The demand, together with that created by the opening up of mining engineering and the rope transmission of power in industries, led Tubbs Brothers to found a rope walk in San Francisco in 1856.

This firm, now known as the Tubbs Cordage Company, has steadily produced rope of high quality for nearly three quarters of a century which has elapsed since that time. The firm has followed a policy of steady improvement in manufacturing methods and design of rope that has spread due to a reputation for reliability in its products. The old rope walk was a great landmark in San Francisco. It was 2500 feet in length and has, in its time, produced some mighty hawsers. Twine and cordage are now wound by machinery. From binding twine, made on specifications figuring a working strain of 140 pounds, to 16-inch hawsers subject to pulls of 100,000 pounds, these machines will take care of standard lengths of 750 feet all spun and twisted with the properly adjusted strain and wound on wheels.

Both Manila and sisal fibers are used in rope manufacture, and San Francisco is peculiarly well situated from the standpoint of economical transportation from sources of raw materials for each of these fibers. The best Manila comes from the Abaca plant of the Philippines, and the best sisal from the century plant family, principally grown in Mexico and Central America, Salvador fiber having the best reputation. This material, brought to San Francisco aboard ship, is laid down directly at the factory of the Tubbs Cordage Company.

During the past few years Tubbs Cordage Company has been evolving an improved rope to which they have given the trade name of "Supercore." In this rope a central strand is formed of continuous straight fibre, closely packed inside an outer sheath of twisted yarns. The core, being of long straight fibers of the highest grade, takes the pull without the shear due to twisting, and it is confidently expected from results of long experi-

ments that this new construction will give much longer life to cordage under strain and shock. The core of this superrope taking the strain in this fashion allows the outer wearing surface of the rope to be laid in a manner giving greater flexibility and better wearing surface. Supercore construction is fully patented as to the product and the method of manufacture.

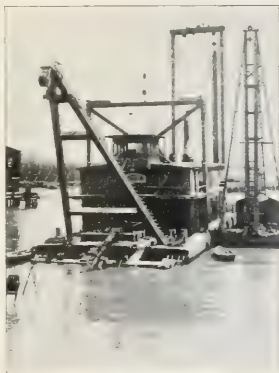
It is a matter of record that a certain rope drive transmission installed in a San Francisco factory by Tubbs Cordage Company twenty-two years ago has carried 300 horsepower every working day since its installation and is apparently in as good condition as when it was installed. Yearly inspections are made of this rope, but beyond the natural darkening with age no defects of any kind are as yet apparent.

Severe Test of Rubber Bearings

THAT rubber bearings hold up well under severe conditions was proved very conclusively by a test recently made in San Francisco Bay waters. Some months ago the American Dredging Company ordered from Ford & Geirine a set of Goodrich Cutless Rubber Bearings for the main shaft of its dredge Yankee, which was then under contract for a big job of hard pan and sandstone removal in the Oakland estuary. These bearings were used to carry the load of the cutter head, which operates at a depth of some 30 feet and works in water saturated with freshly



Two halves Goodrich Cutless rubber bearing from the dredge Yankee after severe wear described in this article.



Dredge Yankee at work.

crushed sandstone. The shaft is 9-5/8 inches in diameter, delivering 200 horsepower at 60 revolutions a minute.

After the job of removing 45,000 yards of rock had been completed, the bearings were taken out for inspection. It was found that less than 1/16-inch of wear had occurred. An illustration herewith shows the condition of the rubber after this severe work. The dredge master was greatly impressed with the results, as he said that had the old style babbit been used, they would have hardly held up for half the job, would have shown at this point a wear of probably a quarter

of an inch and would need renewing at an expense of not less than \$900. These Cutless rubber bearings therefore paid for themselves twice over on this job and are ready for much more work.

The management of the American Dredging Company is sold on

the Goodrich product and is considering its application in the stern bushing of its fleet of tugboats, where these bushings are subject to excessive wear owing to the gritty water in which they operate. Rubber is the logical material for stern bearings under such conditions.

tribution to navigation. It is now being used on all large ships of the Coast and Geodetic Survey in obtaining sounding data for the charts which are supplied to shipping. It is also being used extensively by the United States Navy and by the navies of other important maritime nations.

The Fathometer indicates all depths accurately from 3 to 130 fathoms underneath the vessel. Vessels on which it is now installed are using it to chart their courses, showing the hills and valley undersea which can then be used as landmarks on future voyages.

It is believed by many steamship officials that the widespread use of the Fathometer will prevent most of the strandings and wrecks now caused by lack of knowledge of depth when close to shore in storms and darkness. That the Fathometer marks the greatest advance in aids to safe navigation that has ever been made, and is destined to save countless lives, hundreds of ships and millions of dollars seems unquestionable.

Fathometer on Leviathan

ANNOUNCEMENT that the Fathometer had been installed on the Leviathan as the latest scientific aid to navigation was made recently in New York by William Perrott, operating manager for the United States Lines, who said that it completed all tests successfully on the first voyage.

"I regard the Fathometer as one of the greatest improvements in the science of navigation in recent years," said Mr. Perrott. "It is proving itself to be invaluable to navigation of the Leviathan. I have recommended to the American Committee of the International Conference on Safety at Sea, which meets in London next year, that its adoption should be endorsed as standard equipment on every passenger vessel."

"The Fathometer is especially valuable in approaching land where knowledge of depth is most important. With its aid the Leviathan is able to pick up the 100-fathom curve off the Grand Banks at full speed."

The Fathometer consists of an indicator with a clock like dial mounted in the chart room on the bridge, and a receiver for receiving the echo and a sound sender in the hull of the vessel well below the water line for sending the sounds downward to the bottom.

The time required for the return of the echo is timed to a split second and is translated in fathoms of depth on the Fathometer dial. The ship's master can read the depth as quickly as he can the time of day. The echoes are indicated steadily many times a minute, so that the flashes of light which show the depth come in a continuous stream. The instrument is put into operation by pressing a button and continues to operate until it is turned off.

Commodore Cunningham of the Leviathan also expressed his satisfaction with the operation of the Fathometer. In his report to the United States Lines, he said in part as follows:

"It has been given a strenuous

test since the installation, and it has far exceeded our highest expectations; not only do I approve of it for this ship, but I am of the opinion that it should be installed on all the ships of the United States Lines. So far as its usefulness in the matter of safety, it stands in a class by itself, for there is nothing with which to compare it at the present time; it has brought the mariner's dream of Paradise one step nearer."

Various United States Government departments have cooperated with the Submarine Signal Corporation of Boston in developing the Fathometer as an important contri-

Apollo Chrom

By Martin H. Kidder

IN marine building, the new metal, Apollo Chrom, produced by the Apollo Metal Works of La Salle, Illinois, is going to meet with approval. Being non-rusting, non-tarnishing, and corrosion resistant, its place is assured in such installations as sinks, galley equipment, and trim for staterooms or public rooms where a beautiful platinum-like finish is desired.

Being used in the manufacture of sinks, table tops, trim, and in every place a high-grade metal is required, it is meeting with approval. In such severe use as metal tubs for washing machines, the quality and beauty of this metal are giving wonderful service. Refrigerator trim is another application. Many manufacturers, among them the leaders in automotive, plumbing, refrigeration, washing machine, restaurant, and cafeteria equipment, stamping manufacturers, and others are using chromium in their production. In each of the above trades and in hundreds of others, chromium is being used to insure a beautiful, non-tarnishing, non-rusting finish of quality.

Apollo Chrom is an exclusive product of Apollo metal, which is pre-

pared in sheets or strips ready for immediate fabrication without the necessity of plating, polishing, lacquering, japanning, or finishing in any way.

It is a finished metal, having for its base highly refined zinc, specially rolled, to which has been bonded copper and nickel and chromium in the proper proportions. Do not misconstrue this finish as "plating," because Apollo's exclusive process binds these metals into a sheet that can be bent, formed, double seamed, and even stamped without damage to its surface. It is light in weight, being 33 per cent lighter than copper and similar metals. Its high-mirror, silver-like surface is unequalled for beauty and long life under rigorous conditions.

Manufacturing processes are under constant rigid inspection, and various laboratory tests are made daily to keep check on quality and lower production costs. The metal is now marketed in sheets up to 36 by 96 inches, and in gauges from 0.008 inch to 0.070 inch at a surprisingly low cost. Thousands of dollars worth of special equipment designed for this work was installed for quick service to users.

Electric Stateroom Heaters

By L. L. Shawber,

Westinghouse Electric & Manufacturing Company

A LONG with the development of the application of electricity to the propulsion and auxiliary machinery of ships, in the constant striving to increase their safety, economy of operation, and comfort of passengers and crews has come a perfected electric wall-type heater which combines the two successful methods of heat distribution, convection and radiation.

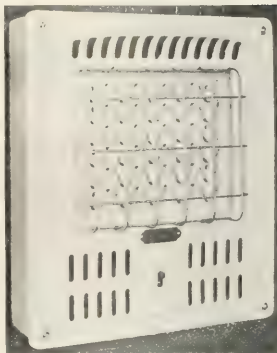
Westinghouse designed the wall-type electric Solar Glow heater primarily for installation in the home. However, its almost instantaneous acceptance by builders and architects demonstrated that the field for which it could be made adaptable was unlimited. Consequently a similar heater was designed, embodying the same principles of heat distribution but equipped with non-corrosive parts for marine application.

The marine type electric Solar Glow heater consists of a metal box, cadmium plated, which can be either mounted flush with or on the surface of the cabin wall, a porcelain refractory brick heating element that slides into the box, and a white or cream enameled cast iron front frame provided with a monel metal guard over the element. All metal parts with the exception of the element wire, which is nichrome, are either made of monel metal or brass.

When the switch is turned on the glowing resistance wires throw out a strong beam of heat, warming the area immediately in front of the heater, similar to the heat rays of the sun. At the same time a portion of the heat is conducted through the refractory porcelain brick to an air space that has been provided in back of the element and a draft is started through the heater. As the air in back of the element is heated it rises out through vents in the top of the front frame. Cold air is then drawn in through the bottom vents, and, passing up between the box and the element, is heated and forced out the top. In this way circulation is effected and the entire room is heated in a comparatively short time.

The Solar Glow Heater is built in any wattage desired from 660 to 3500 and controlled by either a tumbler or 3-heat reciprocating switch.

In order to prevent the currents of hot air from coming in contact



Westinghouse bulkhead type stateroom heater.

with the wall above the heater, a heat shield is placed above the element. This shield deflects the currents of hot air and throws them out into the room. The upper part

of the casting extends outward in a lip so that the hot air rising from the heater is forced away from the wall.

The marine type Solar Glow is designed not to subject parts in contact with wood or other inflammable material to more than 194 degrees Fahrenheit, which is 400 degrees below the point where ignition is possible. Consequently, it is approved by underwriters' associations.

From the important standpoint of weight on board ship, the Solar Glow is peculiarly suitable inasmuch as this electric heater weighs but twenty-five pounds, while the weight of the necessary wiring is negligible. The cleanliness, safety, and efficiency of the marine electric Solar Glow heater particularly adapt it to modern ship construction, and its popularity is evidenced by the growing list of vessels so equipped. The construction of this electric heater makes it easily adapted for installation on any type of vessel.

Among the many modern vessels recently equipped with Westinghouse electric stateroom heaters are the intercoastal liner California and the motor yacht Savarona.

A Fine Service Record

CHAS. Cory & Son, Inc., manufacturers of a large line of communication equipment, including telegraphs for steamer signals, both manual and electric, are famed for the character of their output, and may well be proud of circumstances that were brought to light a short time ago when a steamer of this coast was receiving her annual overhaul. The superintending engineer mentioned to the firm's local distributor the fact that nothing whatever had been done to the Cory telegraphs since they were installed in the year 1897, and that it would be a good idea to give them the once over. This was done and, except for the renewal of one bushing of a bearing so out of the way

that it had not been oiled much, there was nothing whatever to do to the rig. This, after 31 years constant service, would seem to substantiate the claim of the builders that their product is always reliable.

J. M. Lalor, Pacific Coast manager for the business of the firm, handling all matters pertaining to the installation and service, has his headquarters in San Francisco. He reports that his company has secured the contract to supply the fleet of lightships now building at the Albina Marine Iron Works, Portland, Oregon, with all the electric telegraph and signal equipment.

Modern Refrigerating Machinery

THE Samona, W. J. Hole's palatial diesel yacht, has recently been equipped with a modern refrigerating machine. Mr. Hole is accustomed to making long sea voyages, and it has been necessary to carry much greater quantities of fresh foods than is customary in

yachts of this size. Domestic units were tried, and it was found advisable to increase the number of units to produce the proper temperatures under tropical conditions; besides, when away from home waters there was found to be difficulty in obtaining the necessary repair parts, ser-

vice representatives, and supplies.

As a result it was recently decided to replace the three units with a plant of seagoing design, with which licensed engineers everywhere are familiar, and parts replacement is but a matter of minutes in any port.

The Brunswick ice machine is particularly well known in marine fields, and, when it was found that the Marine Engineering & Supply Company in Wilmington not only carried new machines, but an ade-

quate stock of parts and a service department, a unit was selected that took up no more room than had one of the other units and yet gave over four times as much refrigeration as the units removed.

Apparatus of this kind is well known in yachting, the yachts Goodwill, W. W. Shaw's Faith, the new Savarona, and many eastern built yachts are Brunswick fitted, resulting in low upkeep and entire lack of refrigeration troubles for the owners and crews.

castings are alloyed to provide wearing surfaces, tensile qualities, or heat-resisting properties as may be desired in each particular case. Controlled methods of heat treatment and material processing have been carefully supervised.

Accessibility of parts and ease of adjustment have been accomplished in a highly satisfactory degree. Every agency has been provided to reduce maintenance costs.

The fuel system has been designed to facilitate flexibility of control and to guarantee clean combustion at any load or speed within the operating range of the engine. Safety devices have been incorporated to prevent injury to the engine in case of accidental water stoppages or lubrication emergencies.

In brief, the aim of the designers has been to produce a product of sound, modern design of select materials and controlled production methods to be offered to the buying public as a high-grade ultramodern diesel engine at a nominal first cost. The success of the new diesel, according to those who have inspected it, is assured.

The New Standard Diesel

By Harold F. Sherwood

IN the shops of the Standard Gas Engine Company at Oakland, California, an ultra-modern diesel engine is in the course of construction. The Standard Gas Engine Company, well known for many years for its Frisco Standard gas engine, is now endeavoring to excel its reputation with its new diesel engine.

For months the industry has been awaiting a formal announcement of the new diesel of this old-established concern. Now the officials of the company announce that the new diesel has advanced features of design that are based upon the company's extensive background in gas engine experience and the combined experience of European and American diesel engine practice. The gas engine experience acquired by the Standard Gas Engine Company has taught the needs of the customer, and it has also revealed the requirements of service conditions. Also it has divulged the often intricate installation demands.

Considered structurally, the new diesel follows the ultra-modern tendency in clean-line design. In outward appearance it has simple and smooth-flowing surface lines constituting a symmetrical structure which completely houses all moving parts. The framing is so designed as to concentrate stresses within a small radius of influence, thus making possible light weight construction of great strength.

All moving parts are lubricated by forced feed and every auxiliary unit is contained within a single enclosed housing. This construction gives a neat and clean appearance. Moreover, it conserves lubricating oil and assures positive lubrication without attendance.

The various parts are designed under the influence of automotive manufacturing in order that pro-

duction methods and standardization practice can be used to reduce first costs. Many of the small parts entering the construction of this engine are being manufactured in automotive specialty plants. Officials of the Standard Gas Engine Company declare that the materials have been selected to render parts best suited for the service for which they are intended. All principal

Falk Gears Serve Pacific Freighters

IN June 1918 (as completely described in an article appearing in a Pacific Marine Review issue of that year) the motorship Libby Maine was equipped with Dow diesel engines connected to the propeller shafts by Falk 2½ to 1 reduction gears, the engines turning 250 revolutions and the shafts turning 100. At the time this installation was rather unique among motorships.

Since 1918 the Libby Maine has traveled approximately 150,000 miles, serving Alaska canneries and carrying canned goods on various trips for her owners, Libby, McNeill & Libby. The testimony of the general superintendent who has in charge the operation of this vessel is that never has there been one minute's delay in her operation on account of the engines or reduction gears. During the 10-year period one pinion in the reduction gear has been replaced, this being made necessary on account of the engines being out of alignment.

During the past three years the Matson Navigation Company has purchased from the United States Shipping Board six single-screw, turbo-gear drive freighters of the standard type built by the Submarine Boat Corporation. These ves-

sels were equipped with Falk reduction gears. Some of this fleet of six ships had made considerable mileage and some had been laid up for the majority of the time since their delivery by the shipyard. The gears were all carefully examined at the time of taking over by the Matson interests and no appreciable wear was found on either the teeth face of the gears or the bearings. The vessels, after reconditioning by the Matson Navigation Company according to Matson standards for handling freight, have been put on the triangular freight service between San Francisco, ports of the Pacific Northwest, and ports of Hawaii. This is a triangular run of approximately 5500 miles, and the schedule calls for eight or more round trips per year. The latest ship of the six, the Makua, has recently had her trial trip on San Francisco Bay and is now on her maiden voyage.

The service records of the six range from 25,000 miles to 250,000 miles each, and the report of the operating superintendent of the Matson Navigation Company is that there is "no record" concerning the gears, which means of course that the gears have been functioning perfectly.

Trade Notes

Atlas-Imperial Engine Company has absorbed the Oakland, California, plant of the Pacific Diesel Engine Company in a program of expansion. President Sam Eastman and Sales Manager C. C. Kriemler of the Atlas organization are now on a business trip in the Middle Western and Eastern states arranging sales agencies for this popular prime mover.

McIntosh & Seymour Corporation, diesel engine builder, has appointed Eugene V. Winter as West Coast Manager, succeeding Frederick M. Fiske. Mr. Fiske resigned this position to take up the practice of law in San Francisco.

Mr. Winter was formerly Pacific Coast sales manager for the Pacific Diesel Engine Company. He is a native son of California, is thoroughly familiar with diesel engine problems, both from the technical and selling standpoints, and is well and favorably known to the marine fraternity on the Pacific Coast. Following a trip to the McIntosh & Seymour plant at Auburn, New York, to familiarize himself with the policies, equipment, and product of that corporation, Mr. Winter is back at his headquarters in San Francisco.

Botfield Refractories Co., Philadelphia, manufacturer of Adamant fire brick cement, Adamant-Adachrome, and the Adamant gun, announces the appointment of W. E. Tierney as its representative in the South and Southwest. Mr. Tierney is a mechanical engineer and a graduate of Tulane University. Mr. Tierney's headquarters will be in New Orleans.

Frank G. Bryant, California representative of the **Winton Engine Company** of Cleveland, announces the removal of his office to 487 Chamber of Commerce Building, Los Angeles, California.

Columbian Rope Company recently announced the opening of a sales office at 1083 Dresel Building, Philadelphia. A. E. Chase, who is well known to the jobbing trade of that vicinity, is in charge of this office.

The following changes in sales organization are announced by the

Van Dorn Electric Tool Company of Cleveland:

E. J. Phillips, who has been selling Van Dorn products in Detroit, has been moved to San Francisco to take over that territory for the Van Dorn company. His place in Michigan will be filled by his brother, George Phillips.

J. F. Spaulding has been transferred to the Baltimore territory to fill the vacancy resulting from the transfer of Jack Beggs from Baltimore to headquarters at Cleveland.

Warren Steam Pump Company, Inc. of Warren, Massachusetts, announced the appointment of Martin L. Katzenstein, 117 Liberty Street, New York City, as exclusive eastern marine representative.

The **Coatesville Boiler Works** of Coatesville, Pennsylvania, has recently established an office in San Francisco in charge of F. G. Kutz.

This firm builds Scotch marine boilers, which for many years have been favorably known in the American merchant marine. They build also water-tube boilers of the Badenhausen type and many special types and shapes for industrial purposes.

Mr. Kutz has had long experience on the Pacific Coast; in fact, his father, George F. Kutz, was selling marine boilers on this coast for many years, and F. G. Kutz was brought up at that game. His many friends wish him much success in the present venture.

In order more adequately to serve the large steel producing group, the **Vanadium Corporation of America**, 120 Broadway, New York, N.Y., has opened an office at 2245-2246 Henry W. Oliver Building, Pittsburgh, Pennsylvania, under the direction of J. Alfred Miller, Jr., general manager of sales of the Vanadium Corporation.

Appointment of N. L. Mortensen as chief engineer for **The Cutler-Hammer Mfg. Co.**, Milwaukee, was announced effective September 1.

T. E. Barnum, former chief engineer has been appointed consulting engineer for the company, in which position he will be able to give uninterrupted attention to engineering problems and outside engineering relations.

Mr. Mortensen has been connect-

ed with Cutler-Hammer for 21 years, the last 5 of which have been as assistant to Mr. Barnum. Born in Denmark and receiving his technical education there and in Germany, Mr. Mortensen's versatility as a control engineer has long been recognized by United States industry. Articles by him have appeared frequently in the technical press and he has delivered numerous papers before electrical societies. He is a fellow of the A.I.E.E. and a member of the A.I.S.E.E. Mr. Mortensen assumes his new post with the best wishes of his host of friends and all the industry in general.

Ets-Hokin & Galvan, electrical engineers of San Francisco and Wilmington, have been given the contract to supply electrical equipment for two new boats under construction for Pacific Coast fishing; one at the Oakland yard of Wm. Cryer & Son, the other at the yard of Anderson & Cristofani, Hunter's Point, San Francisco.

Besides this work, Ets-Hokin & Galvan supplied the electrical equipment for the new fishing boat Catherine Paladini and for two fishing boats built for Messrs. Medina and Correa, as well as one for the Western California Fish Co.

Cooke Seal Ring announce the appointment of C. W. Lane, San Francisco, as distributor of their product in the central California district. The Cooke seal ring is an assembly of rings and spring which will seal a stuffing box gland perfectly on any rotating shaft.

The entire assembly of the Cooke seal ring revolves with the shaft on a ground face on the stuffing box gland and is lubricated and sealed with oil from the stuffing box which is used as an oil reservoir.

This ring assembly was developed and perfected by George J. Cooke of the Cooke Cold Storage Company, Chicago, as part of the design of a small ammonia compressor for household and commercial use. Late in the year 1925, the Cooke Seal Ring, after being thoroughly tested and found perfect, was offered to the public. It found immediate favor, and by the end of the year 1927 over a quarter of a million Cooke seal ring assemblies had been sold and installed in a world-wide distribution covering a great variety of uses.

Modern Coal-Burning Bulk Cargo Carrier

OUR illustrations show an interesting type of cargo ship, one of three building by the Caledon Shipbuilding & Engineering Co., Ltd. of Dundee, Scotland, for Watts, Watts & Co., Ltd., of London. The picture and the information composing this article were furnished through Swayne & Hoyt, Inc., of San Francisco, for whom Watts, Watts & Co. are exclusive London representatives.

The Watford was designed with the idea of facilitating rapid loading and discharging of cargoes, particularly coal and grain. She is 405 feet long between perpendiculars, 54 feet beam, and carries 9000 tons deadweight on 24 feet 8 1/4 inches draft. She is one of the largest single deck steamers afloat. The hatches are 30 feet by 24 feet, with compensating deep fore and aft girders constructed above the deck and with the deck plating considerably thicker than in the ordinary design of vessel of this length. The deck thus becomes in effect a suspended bidge. Positions of hatches with relation to bulkheads have been very carefully worked out to give easy trimming. Permanent steel center line bulkheads are fitted between the hatchways. These prevent shifting of bulk cargoes and stiffen the deck in the way of the winches.

Eleven steam winches are fitted, all of the derricks being of the 5-ton capacity, except one, which will handle up to 25 tons. Sailing ship type masts for an aerial are provided with an arrangement for lowering these to a level with the top of the funnel when necessary for passing under bridges.

Crew accommodations are con-



The British steamship Watford.

siderably above the average standard for freighters. Officers are berthed amidships, sailors forward, and firemen aft. A shaft is arranged aft by which the firemen are able to descend to the propeller shaft tunnel and so reach the boiler room without going on deck.

The machinery was installed by the North-Eastern Marine Engineering Co., Ltd., Wallsend-on-Tyne. It consists of a triple expansion engine with cylinders 25 1/2, 42, and 70 inches in diameter and a stroke of 48 inches. Steam is supplied by three single-end coal-burning Scotch boilers, 185 pounds working pressure. A rather novel arrangement is used in the funnel, which is divided into three chambers, giving a separate independent up-take from each boiler. This arrangement was used to avoid back draft and to allow any one of the three boilers to be used as an auxiliary boiler without impairing its draft. The outer funnel casing is carried right down to the stoke hold, thus giving an air duct which will improve the ventilation of the fire room and keep the tops of the boilers free from accumulation of dust.

Spectacle screen bulkheads are fitted, both forward and aft of the boilers, to insure better heat insulation and aid the natural draft.

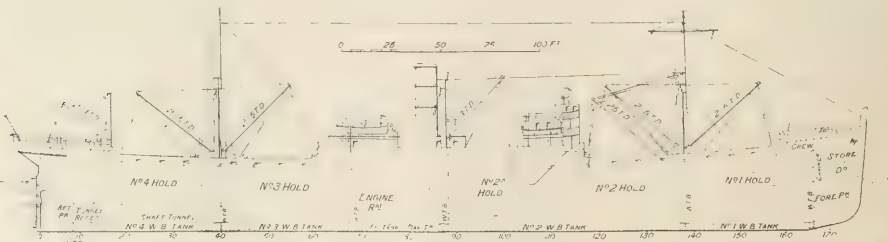
A completely equipped workshop is fitted in connection with this engine room. Lathe, shaper, drill press, emery wheel, and grindstone are driven from shafting deriving power either from main engine or generating set.

On trials, the Watford made 12.3 knots light and 10.74 loaded, and it is estimated that she will maintain a speed of 10 knots loaded on 30 tons of good Welsh coal a day.

UNION DIESEL ENGINE CO.

The Union Gas Engine Company of Oakland, California, established in 1885, announced that it has discontinued the manufacture of gas engines, and has changed its name to Union Diesel Engine Company.

For the future this pioneer engine builder will specialize in good diesels and will continue to carry on the manufacturing and selling policies that have made "Union" the synonym of "Quality" all over the Pacific Slope.



The steamship Watford, 9000 tons deadweight capacity on 24 feet 8 1/4 inches draft; one of the largest single-deck freighters built.



Marine Insurance

Edited by JAMES A. QUINBY

Limitation of Liability

A Simple Explanation of a Shipowner's Privilege

MENTION limitation to your layman friend, fair average quality, 1928 crop, and he will immediately wax indignant.

"It's not fair," says he. "If I run into a Rolls-Royce with my 1922 flivver, can I get out of it by surrendering the Lizzie? And yet the owner of any decrepit, worm-eaten barge can do a million dollars worth of damage with the thing, and blandly tell the injured party to take the barge. There's no individual equity in that sort of thing."

And our f.a.q. friend is about right—thee is no individual equity in the principle of limitation. It is distinctly

an institution for the encouragement of ship owning, and as such, an instrument of public policy. Modern cargo carriers may carry goods whose value runs into the millions. Cargo value often exceeds hull value by two or three hundred per cent. If there were no limit upon the liability of a shipowner, working capital would steer clear of salt water and turn to inland channels.

But a country must have a merchant marine, so natural or competitive handicaps are surmounted by legislative enactments such as our limitation statute and the Harter Act.

Not a New Idea

The necessity of limiting the liability of a shipowner was apparent even in early times. The O'donnance de la Marine of Louis XIV, in an article which was apparently merely an affirmation of the existing law, provides that "the proprietors of vessels shall be responsible for the acts of the master, but they shall be discharged by abandoning the ship and freight."

The importance of encouraging maritime adventures during the Middle Ages led most of the early maritime nations to adopt code provisions expressly defining the principle of limitation. Even in countries where there was no statutory expression, the courts were inclined to give effect to the theory. In 1831, Judge Ware of the District Court in Maine, in *The Rebecca*, 20 Fed. Cas. No. 11,619, remarked as follows:

"I think it may be safely affirmed that, by the general maritime law of Europe, the liability of the owners for the wrongful acts of the master is limited to the interest they have in the ship, and that by abandoning

".....Another Man's Poison"

When I followed the sea for a hvin'
I never could save up a dime.
For I spent all I got, though it wasn't a lot
And what was left over was mine
For that I ate salmon and worm eaten chow
And bunked in a populus bed
Or wet to the bone, I shivered alone
Standin' watch on the fo'c's'l head

So I gave up the seas as a callin'
And I have my decision to thank
For a job and a home and a future to come
And a nice little wad in the bank.
So you as desires a life of success
Must consider the things that I write,
(The things that I do are peculiar, that's true,
I'm shippin' to sea tonight.)

J. A. Q.

the ship and freight to the creditor they discharge themselves from all personal responsibility."

Our Federal Statute

It was therefore natural that Congress, in 1851, should pass the Limited Liability Act, (R. S. 4283, U. S. Comp. St. 8021) reading as follows:

"The liability of the owner of any vessel, for any embezzlement, loss, or destructions, by any person, of any property, goods or merchandise, shipped or put on board of such vessel, or for any loss, damage, or injury by collision, or for any act, matter, or thing, lost, damage or forfeiture, done, occasioned, or incurred without the privilege, or

knowledge of such owner or owners, shall in no case exceed the amount or value of the interest of such owner in such vessel, and her freight then pending."

This statute was amended by the Act of June 26, 1884 (U. S. Comp. St. 8028) providing that the individual liability of a shipowner shall be limited to the proportion of any or all debts and liabilities that his individual share of the vessel bears to the whole, and by the Act of June 19, 1886, extending the benefit of limitation to owners of vessels used in inland waters.

The basic principle underlying the original statute is clearly set forth in *Norwich and New York Transportation Co. vs. Wright* 20 L. Ed 585, decided in 1872.

"The great object of the law," says Justice Bradley in that case, "was to encourage shipbuilding and to induce capitalists to invest money in this branch of industry. Unless they can be induced to do so, the shipping interests of the country must flag and decline. Those who are willing to manage and work ships are generally unable to build and fit them. They have plenty of hardiness and personal daring and enterprise, but they have little capital. On the other hand, those who have capital and invest it in ships, incur a very large risk in exposing their property to the hazards of the sea and to the management of seafaring men, without making them liable for additional losses and damage to an indefinite amount. How many enterprises in mining, manufacturing, and internal improvements would be utterly impracticable if capitalists were not encouraged to invest in them through corporate institutions by which they are exempt from personal liability or from liability except to a limited extent? The public interests require the investment of capital in

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shipbuilding quite as much as in any of these enterprises. And, if there exist good reasons for exempting innocent shipowners from liability, beyond the amount of their interest, for loss or damage to goods carried in their vessels, precisely the same reasons exist for exempting them to the same extent from personal liability in cases of collision. In the one case as in the other, their property is in the hands of agents whom they are obliged to employ."

Unlike the Harter Act, which applies only as between a common carrier and its cargo, the limitation defense may be employed against claims for damage, death, or personal injury suffered by persons or property not upon the limiting vessel, although in *Ex Parte Phenix Ins. Co.*, 118 U. S. 610, it was held that the act could not be asserted as a defense where a fire had spread from a vessel to shore, and had done damage on shore, the theory being that the tort was consummated upon land, and that the limitation statute, being a creature of admiralty, could not be invoked in such a case.

It has been held that the privity or knowledge of the owner, in order to deprive him of the right of limitation, must be personal in nature, and must be directly connected with the fault or defect which caused the loss. Cases are numerous in which the right to limit has been granted where the defect or fault causing the loss has been traced to a hired repairman, then absolving the owner from personal culpability.

Time and Extent of Limitation

It can readily be seen that some arbitrary period of time prior to an accident must be set within which claims may be avoided by limitation. The absence of such an arbitrary period would work a hardship upon claimants, especially since the Act of 1884 extended the benefit of exemption to debts as well as torts, and would enable a shipowner to wipe out with one stroke all accumulated debts against the ship. To avoid such an inequitable result, our courts have taken the voyage as a unit, and have permitted the owner to protect himself by limitation only as to claims arising on a single—not a round trip—voyage.

For limitation purposes, the value of the vessel and her pending freight is taken immediately after the end of the voyage, or, if the voyage is broken up by the accident, immediately after the accident. Thus, under American law, if a vessel be totally lost, the liability of her owner is practically nothing.

England's limitation statute, in place of allowing the owner to surrender the wreck and freight, places an arbitrary tonnage restriction upon his exemption, embodied in the Act of 1894 (57-58 Victoria C 60), which reads as follows:

"The owners of a ship, British or foreign, shall not, where all or any of the following occurrences take place without their actual fault or privity; (that is to say (d) where any loss or damage is caused to any other vessel, or to any goods, merchandise, or other things whatsoever on board any other vessel, by reason of the improper navigation of the ship, be liable for damages beyond the following amounts: . . . (ii) in respect of loss of, or damage to, vessels, goods, merchandise, or other things, whether there be in addition loss of life or personal injury or not, an aggregate not exceeding eight pounds for each ton of their ship's tonnage . . ."

Under the British Act, the time at which the vessel's tonnage is figured is immediately prior to the accident.

While under our law the owner must account for and surrender pending freight and damages recoverable from another vessel in collision cases, he does not have to surrender salvage earned during the voyage nor insurance payments collected by him, as such items are considered a collateral to the voyage and not strictly interests in the vessel.

A shipowner may assert his right to limitation at any stage of a claim, even after judgment is rendered against him. In legal parlance, he asserts his right by filing a petition to limit liability, accompanied by a surrender into court of the vessel herself, or a fund equivalent to her value. If the vessel is found liable the court will distribute the fund so acquired among those who have suffered on the voyage.

There are, of course, many collateral issues of the doctrine of limitation which may not be adequately treated in an article of this sort. Suffice it to say that the right to limit is one which is firmly fixed in our law and should be understood by all owners and insurers who may have to prosecute or defend claims against seagoing vessels.

When is Under Deck?

THE Liverpool Underwriters Association have recently received the following letter from Adjuster of Claims for the Union Marine Insurance Company of that city.

"Early this year a claim was placed before our Glasgow Office for damage to lumber which had been shipped by the Jacob Christensen and for which "under deck" bills of lading had been issued. The goods were stowed in the bridge deck and on this account the claim was first refused. Later it was compromised by the shipowners paying 50 per cent of the damage, Underwriters paying the balance. We are now advised that the National Lumber Exporters' Association has taken this matter up vigorously with the steamship lines in the United States and the Association has notified ship-

INSURANCE COMPANY

Freights and Disbursements

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W. H. WOODRUFF, Manager, Southern California Marine Branch
740 SOUTH BROADWAY
LOS ANGELES

CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

109 COLMAN BUILDING, SEATTLE, WASHINGTON

owners that they will hold them (the shipowners) responsible for damage suffered by lumber stowed in the bridge deck spaces when bills of lading describing same as having been shipped under deck have been issued. We think it might be advisable for Underwriters generally to be aware of this notice to shipowners, as it might assist them in dealing with claims presented to them in similar circumstances. There would appear to be a contention that in certain vessels where the bridge deck space is enclosed, the shipment is properly described as under deck, but the Lumber Exporters' Association has not been convinced as to this."

If the Carriso case proves to be good law (see Pacific Marine Review for May, 1928), shipowners will not have to worry as to whether bridge space is on or under deck, provided the optional stowage clause is inserted in the bill of lading.

It will be recalled that the Carriso bill of lading gave the ship "liberty to carry the goods or any other goods on deck or under deck." The clause was upheld by the District Court at San Francisco, and the cargo owner whose goods were damaged by on-deck stowage has carried the case to the Circuit Court of Appeals, alleging that the lower court's decision was in error in that the clause in question is in conflict with the Harter Act requiring proper care and custody of cargo.

The case will be argued before the appellate court some time this month.

Extend Service to Los Angeles

Edward Brown & Sons, Pacific Coast general agents for the Globe & Rutgers Insurance Company, have opened a Marine Department in Los Angeles under the direction of R. M. Campbell, with offices in the Associated Realty Building.

Mr. Campbell has a host of friends in the new territory, having been connected with the Campbell-Tjader & Co., marine insurance brokers, and later with the Matt T. Mancha Company, in which latter firm he held the position of manager of the marine insurance department.

Mixed Cargo

Marsh and McLennan, nation-wide brokerage and adjusting firm, have organized a corporation for operations in British Columbia under the name of Marsh and McLennan, Ltd., of British Columbia, and have opened offices in the Standard Bank Building, Vancouver, in charge of J. G. Cochrane, formerly with their Seattle marine department.

Mr. Cochrane has been well known in Pacific Coast marine circles since 1918, having been associated with M. C. Harrison & Co. in San Francisco and Seattle, from which latter connection he resigned in 1927 to become assistant to Robert O. Fleming, vice-president and general manager of Marsh and McLennan at Seattle.

There seems to be a well-defined movement of former Californians to British Columbia. If Horace Greely had lived today, he might have said, "Go north, young man, go north."

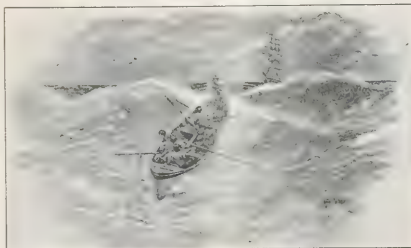
The latest addition to the ranks of the northerners is our good friend Tom Randall, formerly assistant to George Ismon, Pacific Coast marine manager for the Phoenix Assurance and Union Marine.

Mr. Randall has removed to Vancouver, British Columbia, to accept the position of marine manager for Ceperley, Rounsefell & Co., one of the largest general insurance firms in the northern port.

After the mishaps to the Floridian and Kentuckian, it looks as if the American-Hawaiian had better lay off the Solid South when choosing names for their vessels.

We note, with congratulatory sentiment, the transition of the law offices of Ira S. Lillick to the firm of Lillick, Olsen and Graham, with enlarged quarters in the Bal-four Building, San Francisco.

Chalmers Graham, who lives in the Seaclyff neighborhood, says that when he worked for the General Steamship Corporation, the foghorns in the Gate kept him awake all night. Now that he's an admiralty attorney, the same foghorns make sweet music for his dreams.



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BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

New Lookout for Los Angeles Marine Exchange

THE new lookout station opened by the Los Angeles Marine Exchange last July is proving a great convenience to the half-dozen exchange workers at the Harbor. Twenty-four hours a day service is maintained at this lookout. The station is located atop of the seven-story municipal warehouse at the harbor entrance and enables its keepers to give the first news of a vessel's arrival and the last word of her departure.

Displacing an unsafe, temporary little shack erected by the Navy during the World War, the new station is a substantial building containing every convenience and appliance for conducting the Exchange's harbor business. It is surmounted by a 15-foot tower supporting a powerful Cooper-Hewitt red beacon light. This light, 150 feet above



Front view of the new lookout for the Los Angeles Marine Exchange.

the water and, being visible 25 miles at sea, is the first light seen by arriving vessels. It serves also as an airplane beacon.

Aided by a large megaphone, an Exchange worker frequently hails arriving and departing vessels, giving or receiving important messages, which are relayed by telephone to interested parties.

The Exchange was organized five years ago by the Los Angeles Chamber of Commerce. During that time it has reported over 30,000 vessels, including 7500 in 1927, and has kept statistics of the huge volume of ocean freights entering and leaving Los Angeles Harbor.

The Exchange maintains a headquarters in the Chamber of Commerce building at Los Angeles, where there are six workers under the direction of Captain Paul Chandler, manager of the Exchange. G. A. Glasscock, service manager of the harbor office, is assisted by J. E. Clarke, A. E. Gram, A. W. Goldsworthy, Frank D. Mar-

shall, and E. F. Sale. At the Chamber office E. N. Varnado serves as statistician. Other employees are Hazel A. Hartley, Ethel G. Scanlon, and Henrietta Schleppey.

Most of the Exchange's expenses are met by its 256 subscribers, who pay from \$5 to \$300 per month, depending upon the nature and extent of the service rendered. An average of 200 phone calls a day are answered expertly. Information on all shipping subjects is available 24 hours a day. A weekly bulletin is issued to subscribers and an annual statistical report published, and an immense amount of information is disseminated through correspondence and other media.

Captain Chandler, who assisted in the organization of the Exchange, formerly represented the Luckenbach Steamship Company at Los Angeles and other Pacific Coast ports. He has had charge of the Exchange since July, 1927, and has been instrumental in making it one of the successful marine service bureaus in the country.

Tuffite Sees You Through

TUFFITE is the trade name of a product handled by the C. E. Rhodes Co., steam specialty and packing dealers of San Francisco.

This product, manufactured by the Stewart R. Browne Mfg. Co., Inc., New York, is said to be one of the best materials in use for pump valves and piston packing rings for pumps. It is fully guaranteed to hold up under all conditions of liquid handling, either hot or cold. Acids have no effect on it, and gasoline and oil are equally unable to injure its body. It will neither break, swell, nor warp and has been subjected to most severe tests under long operation at sea in pumps which, before this material was installed, had to be laid off and an extra pump put on for ring and valve renewals.

Local distributors can furnish Tuffite machined to any size ring, valve or gear.

Users who are conservative old-time marine engineers give Tuffite a high name for service. In fact, as one of these gentlemen recently remarked to a Pacific Marine Review representative, "Since we put in Tuffite Valves, over a year and a half ago, we have made no renewals. Inspection shows no wear at all, and continuous service, handling hot to warm oil, shows a highly satisfactory record. Tuffite for me, every time!"



Rear view of lookout showing the tower and beacon.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Shipbuilding Work in Prospect

Dollar Announces Plans For Ship Construction

Two mail subvention contracts have been awarded to the Dollar interests for carrying mail between San Francisco and Manila and Seattle and Manila, under the Merchant Marine Act, 1928. These two contracts will give an annual income of about \$1,258,000 to the American Mail Line and of about \$1,700,000 to the Dollar Line out of San Francisco. Following this award the Dollar Steamship Company, through its Vice-President, R. Stanley Dollar, has announced that bids will soon be asked a three new ships to be put into these services in accordance with terms of the contract.

According to the report, the propulsion of the ships will probably be similar to that of the California, which has made such a very favorable impression on Pacific Coast operators. The new Dollar vessels will be about 650 feet long, with accommodations for about 250 passengers.

"The design for the new vessels," said Mr. Dollar, "is based on long experience in the Oriental trade. . . . The vessels will embrace all modern ideas in ship construction and will be the best in every way that the best brains backed by ample financial resources can produce."

Bids will be asked soon on the construction of these three vessels, the first of which will be ready for service in about two years. The cost will approximate \$7,000,000 each.

Dollar Line to Recondition Liners

Dollar Steamship Company, San Francisco, has purchased the steamers Manchuria and Mongolia from the International Mercantile Marine Company, and will recondition them at an approximate cost of \$1,500,000 each. The Manchuria will be delivered at New York at the end of the present voyage. It has been rumored that bids will be asked on-

ly from Eastern shipyards for this work, but this is not official.

All the passenger accommodations of each liner will be torn out and rebuilt.

Bids Asked on Four Passenger-Cargo Vessels

The Export Steamship Corporation of New York, it was announced September 28 by the United States Shipping Board, has notified the Board that it has invited bids for the construction of four combination passenger-cargo ships.

The corporation already has received tentative approval from the Board of a loan of 75 per cent of the cost of the vessels under the construction loan provisions of the Merchant Marine Act of 1928. This is the first request for vessels to be used in the overseas trade under the borrowing features authorized by law.

The vessels, according to the corporation's estimates, will cost approximately \$1,500,000 each, or an aggregate of \$6,000,000.

Approximately \$4,500,000 of this sum would be forthcoming from the construction loan fund of the Board under the loans provisions of the law. The rate of interest would be at the current government borrowing rate.

The vessels are to be of shelter deck type, 450 feet long, 61 feet 6 inches beam, 42 feet 3 inches in depth to shelter deck. The ships will be approximately 8200 gross tons, with a dead-weight tonnage of 9500.

Small Survey Boat Planned.

Bids were opened October 19 at the office of the Chief of the Coast and Geodetic Survey for a tender 77 ft. 6 in. long, 5 ft. draft; equipped with a 110-horsepower engine; to be equipped for surveys in Alaskan waters and to carry about three officers and 12 men.

Shipping Board Gives Approval to Contracts to Dieselize Vessels

The Shipping Board in a resolution adopted October 5 sanctioned the award of contracts totaling \$3,358,985 for the installation of engines and other work incident to the dieselization of six Shipping Board vessels.

The contracts awarded by the Board were as follows: Federal Shipbuilding and Dry Dock Company, Kearney, N.J., \$1,132,900 for work specified on the vessels New Orleans and Wichita; Maryland Dry Dock Company, Baltimore, \$1,106,885, for work specified on the Potter and Jeff Davis, and Newport News Shipbuilding and Dry Dock Company, Newport News, Va., \$1,119,200, for work specified on the City of Elwood and Ward.

The Board also authorized its committee on dieselization to expend not to exceed \$90,000 on the six vessels for contingencies and extras, should any be found necessary during the progress of the work, and to expend not to exceed \$198,000 on the six vessels for the purchase and supplying of any additional and incidental equipment and outfit necessary to fit the vessels for active service.

Ferryboat for State of New York

The New York State Department of Mental Hygiene, Albany, Lewis M. Farrington, secretary, opened bids September 28 for the construction of a ferryboat for the Manhattan State Hospital, Ward's Island; and on October 10 for machinery for the boat. The boat is to be a diesel-electric powered ferryboat of 115-foot length.

Bids Being Considered on Lightship Construction

The United States Department of Commerce, Bureau of Lighthouses, Washington, D.C., has not yet announced award of contract for the construction of three lightships, to be known as Nos. 115, 116, and 117. Among Atlantic Coast shipyards, low bid for the three jobs was sub-

mitted by Charleston Drydock & Machinery Company, for the hull (\$554,766); and by the Winton Engine Company for the machinery (\$153,360 with General Electric motors and generators and \$161,560 with Westinghouse equipment).

The boats are to be similar to those now under construction at Portland, Oregon, by the Albina Marine Iron Works. They will be 133 feet 3 inches over-all, 30 feet beam, 12 feet 6 inches draft, with four 120-horsepower diesel engines.

While bids were not asked from West Coast shipbuilders, the Albina Marine Iron Works submitted, by telegram, a bid of \$546,000 for the construction of three additional vessels delivered wherever specified by the Bureau of Lighthouses. The matter of giving this bid consideration had not been decided to the satisfaction of the Portland bidders up to the time we go to press.

Gulf Line Plans Additions

It is reported from the South that the Union Gulf Line of Galveston is planning the construction of seven passenger, automobile, and car ferries for operation between Galveston and New Orleans.

Canadian Torpedo Boat Construction

Canadian Defense Department, Ottawa, is reported to have received tenders from fifteen yards, one a Canadian builder, for the construction of two torpedo boat destroyers—one for Atlantic and one for Pacific Coast service.

The British Columbia Public Works Dept., Victoria, B.C., has asked for bids to be submitted on the construction of a ferryboat for Lake Kootenay with capacity of 12 large vehicles together with passenger accommodations. The hull is to be metal sheathed to withstand the force of floating ice.

Bids Opened On Mount Vernon and Monticello

Bids were opened at the office of Merchant Fleet Corporation in New York by Captain R. D. Gatewood, manager of the department of Maintenance and Repair, for the cost of reconditioning the steamers Mount Vernon and Monticello for Atlantic Coastwise service.

The bids ranged from \$5,850,000 to \$7,920,000 for conditioning the Mount Vernon, and from \$6,980,000 to \$9,658,000 on the Monticello, and were submitted by the Morse Dry Dock Company, Bethlehem Ship-

As we go to press, it is reported to this office that Ira Bronson, president of the Puget Sound Navigation Company, Seattle, has announced that bids will be requested within a few weeks for a palatial steel passenger and automobile ferry steamship for operation between Seattle and Victoria; with accommodations for 500 passengers and capacity for 70 automobiles.

building Corp., Ltd., Newport News Shipbuilding Co., Sun Shipbuilding Company, Todd Shipyards Corporation, and the Boston Navy Yard.

It is reported that work will not be undertaken by the Shipping Board at this time, as the Congressional appropriation for the total sum to be expended on these vessels is but \$12,000,000. Furthermore, these two vessels are to be offered for sale with the fleet of the United States Line this month, and bids on cost of conversions will be taken into consideration by possible purchasers.

Large Reconditioning Job

The Pacific Steamship Company, of Seattle, Washington, has announced through H. F. Alexander, president, that they have purchased from the American Ship

Recent Shipbuilding Contracts

American Bridge Co., Pittsburgh, has an order from Anderson Tully Co., Memphis, for two barges 160x34x7ft.; also an order from Crucible Fuel Co., Pittsburgh, for two barges 175 x 26 x 11 ft.

Bethlehem Shipbuilding Corp., Ltd., Union Plant, San Francisco, has an order from the Inter-Island Steam Navigation Co., Honolulu, for a sister ship to the Waialeale, which went into service June 1. The new vessel will be 295 ft. L.B.P., 27 ft. 6 in. beam; 17 ft. 6 in. loaded draft; 15 knots speed; 1200 D.W.T. She will be powered with Westinghouse turbines developing 4000 S.H.P.; steam supplied by 4 boilers. The vessel will carry passengers, freight, and automobiles. Work will be supervised by engineers of Matson Navigation Co., San Francisco.

This yard has an order from the Standard Oil Co. (Calif.), San Francisco for a steel tank barge 100 L.B.P.; 23 ft. 5 in. beam; 5 ft. loaded draft; powered with 2 Sterling gas engines developing 100-125 B.H.P.

This yard has just received an order for a smaller steamer from the

& Navigation Corp. the steamer Mount Clay, the former Hamburg-American liner Prinz Eitel Friederick, which has been laid up at Sparrows Point for three years. The vessel has twin screws, is 488 feet 3 inches length, 55 feet 7 inches breadth, and 32 feet 1 inch depth. She has three decks. Propelling plant consists of quadruple expansion engine of eight cylinders. The vessel was built in 1904 at Stettin and is of 8170 gross tons.

The reconditioning of the steamer more than likely will be done on the Atlantic Coast, as the vessel is not in condition to make the voyage to the Pacific Coast.

The vessel, according to Alexander, is to have her passenger accommodations entirely rebuilt and practically every room will be fitted with beds instead of berths. She will have unusually fine deck space and her public rooms will be fitted up in the latest and most modern style.

Plans and specifications for the rebuilding of the steamer are now being drawn up, Alexander said, and shipyards on both the Atlantic and Pacific will be given an opportunity of bidding on the work.

Alexander gave it his opinion that the vessel would be ready to enter the Pacific Coast service during the summer of next year.

Inter-Island Steam Navigation Co. Details of hull are not yet announced, but the vessel is to be single screw with a geared turbine propulsion unit, a duplicate of the unit used on each shaft of the Waialeale. This unit will be arranged to deliver 1700 S.H.P.

Moore Dry Dock Company, Oakland, Calif., has an order from the San Diego-Coronado Ferry Co., a subsidiary of the Spreckels interests. The boat will be 190 ft. over-all, 60 ft. breadth over guards, 14 ft. 9 in. depth; powered with Atlas-Imperial diesel engines and Westinghouse motors.

Dravo Contracting Co., Pittsburgh, has an order from Merchants and Miners Transport Co. for two steel house barges, 120 x 30 x 7 ft.; also order from Ohio River Sand Co., Louisville, for three standard barges 130 x 30 x 7 ft. 6 in.; also order from Ohio River Sand Co., Louisville, for three standard barges 130 x 30 x 7 ft. 6 in.

Nashville Bridge Co. is building two deck barges for stock; 110 x 28 x 7 ft. 3 in.

Prince Rupert Drydock & Shipyard, Prince Rupert, B.C., has an order from John Currie & Son for a wooden tug, 40 x 12 x 6 ft. to be powered by 30 B.H.P. gas engs.; keel was laid Oct. 1.

Staten Island Shipbuilding Co., Mariner's Harbor, N.Y., has an order from Grasselli Chemical Co. for a barge 150 x 38 x 12 ft. 6 in.

Ritter-Conley Co., Pittsburgh, has an order from the Mississippi River Com. for 31 steel barges 120 x 30 x 7 ft., to cost \$10,263 each.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Mass., has an order from the Erie Railroad, 50 Church Street, New York, for a steel carfloat.

Bethlehem Shipbuilding Corp., Ltd., Fore River Plant, Quincy, Mass., has been awarded contract by the New England Steamship Company for the construction of a passenger and automobile steamer for coastwise service. The vessel will be 240 feet between perpendiculars, 45 feet molded beam, 60 feet over guards, 16 feet molded depth, 10 feet draft. The propulsion plant will consist of two 4-cylinder, triple expansion steam engines each supplying 2000 horsepower to the twin screws. Babcock & Wilcox boilers will supply the steam.

This company also has an order for a steel carfloat for Erie Railroad of New York, to be built at the Sparrows Point Plant.

Canadian Vickers, Ltd., Montreal, has received a contract from the National Revenue Department of Canada at Ottawa, for the construction of a 17-knot cruiser for the Customs-Excise preventative service on the Atlantic Coast.

The boat will be of all steel construction, 170 feet length at water line, 21 feet breadth, 13 feet depth, powered with three Winton diesel engines, direct-connected to triple screws. The vessel will be of unusually strong construction and will be thoroughly fitted out with all auxiliaries and machinery necessary for her service, as well as comfortable accommodations for 21 officers and men. The cost is said to be \$299,160.

Midland Shipbuilding Co., Midland, Ontario, has an order from Canada S.S. Lines, Montreal, for a 2-deck cargo freighter; 250 L.B.P.; 42 ft. 9 in. beam; 14 ft. loaded draft; powered with triple expansion steam engines developing 1300 I.H.P.; 2 Scotch boilers; 12 miles speed; 2200 D.W.T.

Defoe Boat & Motor Works, Bay City, Michigan, has an order for a wood yacht for C. W. Bonbright of Flint, Michigan. The boat will be 61 ft. L.B.P.; 13 ft. beam; 4 ft. draft. She will be powered with

300 horsepower gas engines. Keel will be laid October.

Contracts for Dirigibles Awarded

Secretary of the Navy Curtis D. Wilbur has announced that the special Naval Board appointed to pass on designs and bids for the construction of two dirigibles has awarded the contract for their construction to the Goodyear Zeppelin Company of Akron, Ohio, a subsidiary of the Goodyear Tire and Rubber Company. The bid was \$7,950,000, including construction of hangar.

News From the Shipyards

AERICAN Brown Boveri Electric Corporation announces effective October 1, 1928, the separation of its electric and shipbuilding activities by organizing a subsidiary completely owned, under the name of **New York Shipbuilding Company** leasing to the new company all of the real estate and plant embraced in the active shipbuilding facilities at Camden, New Jersey.

The New York Shipbuilding Company will take over and complete all existing ship contracts for the American Brown-Boveri Electric Corporation.

The management includes: W. M. Flook, Chairman of the Board; C. L. Bardo, President; J. E. Slater, Vice-President and Treasurer; E. I. Cornbrooks, Vice-President and General Manager; M. H. Torbet, Assistant General Manager; E. H. Rigg, Naval Architect; Norman R. Paiker, Comptroller; A. G. Connell, Secretary.

Work now in progress at the plant of the New York Shipbuilding Company includes: U.S. scout cruisers Salt Lake City and Chester, and the machinery for the U.S. scout cruiser Pensacola building at the New York Navy Yard, as well as orders for car floats and steam lighters for the Pennsylvania R.R.

REPAIRS

United States Navy Yard, Bremerton, Washington, will carry out additions and betterments to the U. S. S. Saratoga which will aggregate \$350,000, work to be done within the next three months. The work is to be classed as new construction and will include alterations in equipment for carrying and repairing airplanes and for defense in time of war; work on the turbines will cost \$50,000.

Work has been authorized on similar additions to the U.S.S. Lex-

ing to cost \$200,000.

General Engineering & Drydock Co., Alameda, received contract for repairs to the tanker Los Alamos, damage in collision with the freighter Kentuckian last month on low bid of \$15,480.

Bethlehem Shipbuilding Corp., Ltd., San Francisco, has been awarded contract for damage repairs to the steamer Kentuckian of the American Hawaiian Steamship Company, which collided with the tanker Los Alamos last month. Bids submitted on this job were:

Bethlehem, \$42,960 and 18 days; General Engineering & D.D. Co., \$44,600 and 26 days; Moore Dry Dock Co., \$47,400, 26 days; Los Angeles Shipbuilding & D.D. Co., \$54,480, 29 days.

United Engineering Co., San Francisco, was low bidder for repairs to the U.S.A. transports Grant and Somme. Bids were submitted as follows:

Grant: United Eng. Co., \$892; General Engineering & D.D. Co., \$1332; Moore Dry Dock Co., \$1184; Bethlehem, \$1430.

Somme: United Eng. Co., \$11,252; General Engineering, \$12,416; Moore, \$11,358; Bethlehem, \$12,622.

Los Angeles Shipbuilding & Drydock Corp. has the Standard Oil tanker Tamaha in yard for repair of collision damage.

Nelson Brothers of Vancouver, British Columbia, have purchased the barkentine S. F. Tolmie and have converted her to a floating herring saltery at a cost of \$20,000. She will be used on the West coast of Vancouver Island. Twenty brine tanks, each 18 by 10 by 4 feet have been installed and an elaborate system of conveyors for diverting the fish to any of the tanks after they are brought aboard. A conveyor from the water's edge to the

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deck of the vessel will facilitate bringing the haul on board. Salt storage capacity has been arranged, and several boilers for operating auxiliaries have been added.

Richfield Oil Company, Los Angeles, has announced through C. M. Fuller, vice-president and general manager, that an extensive program of improvement will be carried out, in fact is now under way, to provide Sacramento and Stockton with adequate storage plant and supply stations for Richfield products. The program will entail an investment of between \$1,250,000 and \$1,500,000. The stations will be supplied by tank barges from the San Francisco terminal.

KEEL LAYINGS

Steel car barge for Canadian National Railways, Vancouver, B.C.; by Prince Rupert Drydock & Shipyard, Sept. 12; wooden tug for John Currie & Son, Oct. 1.

Steel yacht by Defoe Boat & Motor Works, Aug. 1.

Five steel needle flats by Howard Shipyards & Dock Co., Sept. 12.

One steamboat hull for Union Barge Line Corp., Pittsburgh, by Midland Barge Co., in Sept.

Ferry hull for stock by Nashville Barge Co., Sept. 16; two deck bridges for stock, Sept. 25 and 28; ferryboat for Davidson County,

Tenn., Sept. 25.

Hydrographer, survey boat for U. S. Coast & Geodetic Survey by The Spear Engineers, Inc., Aug. 18.

LAUNCHINGS

Two carfloats for Pennsylvania Railroad by American Brown Boveri Elec. Corp., Sept. 25 and Oct. 1.

Vanda, twin screw steel diesel yacht by Bath Iron Works, Oct. 3.

Two steamboat hulls for Union Barge Line, Pittsburgh, by Midland Barge Co., in Sept.; two dump scows for Div. of Canals and Waterways, State of New York, in Sept.; two deck scows for State of New York, in Sept.; 24 discharge pontoons for U.S. Engineers, Rock Island, in Sept.

DELIVERIES

Catherine Paladini, fishing boat to A. Paladini, Inc., by General Engineering & Drydock Co. in Aug.

Ten covered barges to Carnegie Steel Co. by American Bridge Co. in Sept.

One carfloat to Pennsylvania Railroad by American Brown Boveri Elec. Corp., Oct. 5.

Martha E. Allen, motor tanker for Lake Tankers Corp. by American Ship Building Co., Sept. 17.

Elto, wood yacht to T. A. Yawkey, New York, by Defoe Boat & Motor Works, Oct. 10.

& Santa Fe Railway, San Francisco: 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est.; deliver Nov. 10/28 est.

One steel clam shell dredger for Board of State Harbor Commissioners, San Francisco; 90 x 41 x 12'9"; launch Oct. 10/28 est.; deliver Nov. 30/28 est.

PRINCE RUPERT DRYDOCK & SHIPYARD

One steel car barge for Canadian National Railways, Vancouver, B.C.; 270 x 42 x 12'6" depth; keel Sept. 12/28; deliver Jan. 10/29 est.

Wooden tug for John Currie & Son: 49 x 12 x 6'6"; keel Oct. 1/28.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar. Ten covered barges for Carnegie Steel Co.: 175x26x11 ft.; 4 delivered in Sept. /28. Nine coal barges for Union Barge Line, 175x26x11'.

Thirty Mississippi River Commission barges for: 120x30x7'.

One acid barge for American Steel Wire Co.: 100x26x7 ft.

One towboat hull for Tennessee Coal, Iron & R.R. Co.: 140x25x9'.

Two barges for Anderson Tully Co., Memphis: 160 x 34 x 7 ft.

Twelve barges for Crucible Fuel Co., Pittsburgh: 175 x 26 x 11 ft.

AMERICAN BROWN-BOVERI ELECTRIC CORP., Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Chester, light cruiser CL-27 for United States Navy, 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 1/28; launch Nov. 30/28 est.; deliver Dec. /28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel Aug. 21/28; launch Nov. 1/28 est.

Hull 384, carfloat for Pennsylvania Railroad Co.; keel July 19/28; launched Sept. 8/28; delivered Sept. 18/28.

Hull 385, same as above; keel Aug. 6/28; launched Sept. 25/28; delivered Oct. 5/28.

Hull 386, same as above, keel Aug. 11/28; launched Oct. 1/28; deliver Oct. 11/28 est.

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of October 1, 1928.

Pacific Coast

ALBINA MARINE IRON WORKS Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 109, diesel-electric lightship for U.S. Dept. of Commerce, 133'3" length overall, 30' beam, Winton diesel engines, General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY, Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engines; keel Sept. 12/28.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.

Not named, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam, 17'6" loaded draft, 15 knots speed, 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers.

Not named, hull 5337, steel tank barge for Standard Oil Co. (Calif.), San Francisco; 100 L.B.P.; 23'5" beam; 5'0" loaded draft; 2 gas engines; 100-125 B.H.P. each.

GENERAL ENGINEERING & DRY DOCK CO., Alameda, Calif.

Purchasing Agent: Geo. Armes.

Catherine Paladini, hull 16, fishing boat for A. Paladini, Inc., San Francisco; 78 x 18'6" x 6'6"; 10 loaded speed; 200 H.P. Atlas-Imperial diesel eng.; launched July 14/28; delivered Aug. 28.

Hulls 17 and 18, mud scows for Board of State Harbor Comm.; 102 x 29 x 9'3"; delivery July 20/28 est.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wash.

Scow same as above, launched Aug. 13/28.

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.

THE MOORE DRY DOCK CO., Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Western Pacific Railroad, San Francisco; 278' L.O.A.; 38' beam, over all 12'6" molded depth, 7'9" loaded draft; capacity 14 80-ton cars; launch Sept. 28/28 est.; deliver Oct. 10/28 est.

One steel carfloat for Atchison, Topeka

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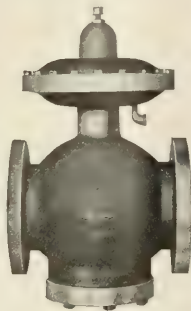
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THE AMERICAN SHIP BUILDING COMPANY, Cleveland, Ohio.

Purchasing Agent: C. H. Hirsching
Martha E. Allen, hull 803 motor tanker
for Lake Tankers Corp.; 334 L.B.P.; 51 ft.
beam; 18 loaded draft; 11½ mi. loaded
speed; 3700 D.W.T.; 1900 I.H.P. Werk-
shop diesel engs; aux. Scotch boiler; keel
Dec. 12/27; launched June 9/28; delivered
Sept. 17/28.

BATH IRON WORKS Bath, Maine

Vanda, hull 117, twin screw steel diesel
yacht; 240"x36"x22'; two 1500 B.H.P. Bes-
semer diesel engs; keel Feb. 3/28; launched
Oct. 3/28; delivered Oct. 24/28 est.

Boston College, hull 119, single screw
steel diesel trawler for Atlantic & Pacific
Fish Co., Boston; 123"x23"x14'; 400 B.H.P.
Fairbanks-Morse diesel engine. Bath Iron
Works design. Keel June 14/28; launch
Nov. 1/28 est.

Holy Cross, hull 120, trawler, same as
above; keel June 14/28; launch Nov. 1/28
est.; delivered Nov. 5/28 est.

Georgetown, hull 121, trawler, same as
above; keel June 14/28; launch Nov.
26/28 est.; delivered Dec. 1/28 est.

Paragon, hull 122, twin screw steel
diesel yacht; 138'3"x19'2"x12'6"; 2 350-
B.H.P. Winton diesel engs. O. L. Swasey
designer. Keel Oct. 15/28 est.; launch
Apr. 10/29 est.; deliver May 1/29 est.

Hi-Es-Maro, hull 123, twin screw steel
diesel yacht, Henry J. Gielow, Inc., New
York, designer; 266'x35'x22' depth; 14'6"
draft; two 1200 B.H.P. Bessemer diesel
engs; keel Nov. 1/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast
Guard Service; 250'x42'x17 ft.; Westing-
house turbines and motors; 3000 S.H.P.;
launched May 19/28; deliver Aug. /28 est.
Tahoe No. 46, sister to above.

No. 47, sister to above.

No. 48, sister to above.

No. 49, sister to above.

Not named, hull 1418, steel passenger
and freight steamship for the Pennsylvania
Railroad Co., West Philadelphia; 300 ft.
length; TE engs.

Not named, hull 1419, steel trawler for
Mass. Trawling Co.; 116 ft. long; 460 gro.
tons.

Not named, hull 1420, sister to above.
Hull 1421, boat for R. O'Brien & Co.;
230 gr. tons.

Not named, Hull 1422, single-screw coal
collier for Berwind-White Coal Mine Co.
1 Broadway, New York; Theo. E. Ferris,
designer; 350 L.B.P.; 50 beam; 23'6" draft;
10,020 tons displacement at 25'3" draft;
10½ knots speed; Hoover, Owens, Ren-
tschler recip. st. eng.; 2200 S.H.P.; 2 Scotch
boilers.

Not named, hull 1423, sister to above;
Bethlehem-Curtis turbines; 1700 S.H.P.;
2 WT boilers.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M.
Wainwright, Indianapolis; 2 Speedway die-
sels, 300 H.P. ea. at 700 r.p.m., wt. 7500
lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan,
Detroit, Mich.; 2 170-H.P. Speedway engs;
deliver May/29 est.

Not named, hull 2925, 64-ft. cruiser for
Rear Admiral L. M. Josephals, New York;
2 170-H.P. Speedway engs; deliver May/29
est.

Not named, hull 2926, 76-ft. cruiser for
Adolph M. Dick, New York; 2 300-H.P.
Speedway engs; deliver June/29 est.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Elto, hull 128, wood yacht for T. A.
Yawkey, New York; 56'x11'x3'; 26 mi.
speed; 35 D.W.T.; 400 I.H.P. gas engs;
keel May 1/28; delivered Oct. 10/28.

Barbette, hull 130, wood yacht for C.
A. Caryell, Bay City; 90 L.B.P.; 17 beam;
4 loaded draft; 12 mi. loaded speed; 75
D.W.T.; 200 I.H.P. diesel eng; keel June
20/28; launch Nov. 1/28 est.; deliver Nov.
15/28 est.

Not named, hull 131, steel yacht, owner
not named; 105 L.B.P.; 17 beam; 6 loaded
draft; 14 mi. loaded speed; 110 D.W.T.;
250 H.P. diesel eng; keel Aug. 1/28;
launch Nov. 1/28 est.; deliver June 1/29
est.

Not named, hull 132, wood yacht for C.
W. Bonbright, Flint, Mich.; 61 L.B.P.;
13 beam; 4 loaded draft; 18 m.p.h.; 300
I.H.P. gas eng; keel Oct. 15/28 est.; launch
Apr. 15/29 est. deliver May 1/29 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmington, Del.

Hull 614, diesel engined towboat for
stock; 125'26" x 26'6" x 5' 6".

Hulls 691-694 inc. four steel carfloats for
New York Central Railroad Co.; 270'x38
x10'5"; 850 gro. tons ea.

Hulls 722-23, 2 standard steel barges
for stock; 130'x30'x7'6"; 250 gr. tons ea.

Hull 734, steel hull derrick barge for
Merritt, Chapman & Scott, Corp.; 116 x 43
x 12 ft.

Hull 735-38 inc., four steel barges for
Keystone Sand and Supply Co., 135 x 27
x 8 ft. 3 delivered.

Hulls 739-740, two steel snag barges for
U.S. Engineers, Memphis; 84 x 24 x 3'6".

Hull 741, oil barge for Atlantic, Gulf &
Pacific Co.; 80 x 30 x 8 ft.

Hulls 744-752 inc., 9 steel hopper barges
for Union Barge Line Corp., Pittsburgh.
175'x26'x11 ft.

Hulls 753-784 inc., 32 standard Missis-
sippi River Comm. barges for Memphis of-
fice.

Hulls 787, 788, two steel house barges
for Merchants and Miners Transp. Co.; 120
x 30 x 7 ft.

Hulls 789, 790, 791, three standard barges
for Ohio River, Sand Co., Louisville, Ky.;
130 x 30 x 7'6".

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FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 104, oil barge for Oil Transfer Corp., 175'x35'x12'5".

Hull 105, oil barge for above; 146'x34'8" x10'21".

Hull 106, lighter hull for J. W. Sullivan Co.; 121'x32'6" x13'41/2".

HOWARD SHIPYARDS & DOCK COMPANY,

Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hulls 1647-1655 inc., nine steel needle flats for U. S. Engineers, Louisville, Ky.; 40'x14'x3'6"; 4 keels laid Aug. 7/28; 5 keels Sept. 12/28; deliver Oct. 6/28 est.

Hulls 1656-7, two barges for Mississippi River Comm., New Orleans, 120'x30'x7'6".

MANITOWOC SHIPBUILDING CORPORATION,

Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge for Great Lakes Dredge & Dock Co., 156 L.B.P.; 43 beam; 10 ft. draft aft; keel Aug. 30/28; launch Jan. 1/29 est; deliver June 1/29 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 234, sternwheel oil barge for Tropical Oil Co.; 203'x44'x5'6"; Marietta tandem comp. eng. 14"x28"x84"; keel July 18/28; deliver Nov. 15/28 est.

Hull 235, sister to above; keel Aug. 1/28; deliver Dec. 15/28 est.

MIDLAND BARGE COMPANY

Midland, Pa.

C. C. Slider, towboat for E. T. Slider, New Albany, Ind.; 145'x32'x7ft. 6in.; steam tandem comp. eng. 14"x28"x70" stroke; keel March 1/28; launched June 23/28.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Two steamboat hulls for Union Barge Line, Pittsburgh; 151'x45'x6'6"; launched.

One steamboat hull for Union Barge Line Corporation, Pittsburgh, Pa.; 151'x34'x6'6"; keel laid.

One steel barge for P. M. Adema, Pointe a la Hache, La.; 120'x36'x6 ft.

Four dump scows for Div. of Canals and Waterways, State of New York; 100'x28'x7'6"; keels laid; 2 launched.

Six deck scows for Div. of Canals and Waterways, State of New York; 75'x25'x5'6"; all launched.

Forty discharge pontoons for U. S. En-

gineers, Rock Island, Ill.; 38'x14'x3"; all launched.

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7".

Three fuel barges for Union Barge Line Corp., Pittsburgh; 100'x24'x8 ft.

Four line barges for U.S.A. Engineers, Vicksburg.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92'x24'x5 ft.; keel May 10/28; launch Jan. 1/29 est.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft; keels laid Aug. 22 (2); Aug. 27 (2).

Hull 161, ferry hull for stock; 150 L. B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28.

Hull 162, deck barge for stock; 160 x 32 x 7ft.: keel Sept. 25/28.

Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft; keel Sept. 25/28 est.

Hull 164, deck barge for stock; 120'x 30'x7 ft.; keel Sept. 28/28.

Hull 165, same as above; keel Oct. 10/28 est.

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28 est.

Hull 167, deck barge for stock; 110 x 28 x 7'3".

Hull 168, deck barge for stock; 110 x 28 x 7'3".

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy, 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launched Aug. 18/28; deliver Nov. 26/28 est.

Not named, hull 329, sister to above; keel Oct. 15/28 est.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr., 272'1" L.O.A.; 36'6 3/4" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launch Nov./28 est.; deliver Apr. /29 est.

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WILMINGTON, CALIF.

THE PUSEY & JONES CORP., Wilmington, Del.

Purchasing Agent: James Bradford.

P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 139" molded depth; keels July 12/28; launched Oct. 5/28 est.; delivered Oct. 5/28.

Not named, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21 1/2' beam; 8'6" app. loaded draft; 2 250-B.H.P. diesel engs.; deliver April 15/29 est.

THE SPEAR ENGINEERS, INC., Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va. General Charles F. Humphrey, hull 1, screw double-end ferryboat for Quartermasters Corp., U.S.A.; 98' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2' m.p. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel July 13/27; launched June 16/28.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.; 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 m.p. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.; 167 1/2' L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 2 400-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor; keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.; 173' L.O.A.; 146' L.B.P.; 57' beam overall; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; two General Electric 270-kilowatt generators; one General Electric propelling motor of 650 H.P.

SPEEDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 264, fire and patrol boat for Commissioners, Washington, D.C.; 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launch Oct. 15/28 est.; deliver Dec. 1/28 est.

STATEN ISLAND SHIPBUILDING CO., Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York; 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.; 150 x 38 x 12'6".

TODD DRYDOCK, ENGINEERING & REPAIR CORP., Brooklyn, N.Y.

Purchasing Agent: H. J. Shannan.

Not named, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure; 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.

TOLEDO SHIPBUILDING CO. Toledo, Ohio

Purchasing Agent: Otto Hall.

Hull 179, dump scow for Central Dredging Co.; 144 x 42 ft.

Hull 180, same as above.

THE CHARLES WARD ENGINEER- ING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.; 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Hulls 71-72, two steel maneuver boats for U. S. Engineers Office, Pittsburgh; 60 x 22x4 ft.; keels laid June 19/28 and July 9/28; launched Sept. 8 and 15/28; delivered Sept. 27/28.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston; 65'6"x17'7 1/2"; 190 B.H.P. Winton diesel eng.

Hull 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army Engineers; 127'x30'x4'4"

Hulls 75-76, two stern-wheel towboats for stock; 64'9"x18'4'5"; diesel eng.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., Union Plant

Drydock, paint, misc. repairs: stmr. Jalisco, Frank H. Buck, R. J. Hanna, Lubrico, La Perla, Providencia, Maliko, Gov. Irwin, Point Bonita, Korrigian III, Mexicon, Sonoma, Capt. A. F. Lucas, Limon, Solano, San Mateo, Radiant, Manoa, H. M. Storey, Maunalei, m.s. Canada, tug Morgan Shell, m.s. Westmor (no repairs). Repair feed water heating coils: DeRoche. Pump repairs: Aurora. Pipe repairs: Pileodon, Bucinum. Caulk rivets and seams on tank tops: Silvery. Make and furnish 1 gypsy head: Astral. Telemotor repairs: Java Arrow. Repairs to steering eng.: Cathwood. Repair cofferdam: Bohemian Club. Boiler repairs: Romulus, Benader. Repairs to expansion joints: Katrina Luckenbach. Propeller repairs: Barbara C. One tailshaft: S. C. T. Dodd, DeRoche. Turbine repairs: President Grant, H. F. Alexander. President Madison, 24 superheater tubes: Pacific. One H.P. piston rod: J. C. Fitzsimmons, R. J. Hanna. Pedestal bearing for H.P. column: Dilworth. Install 8 cargo side doors and 10 trimming hatches on each vessel: Maunawili, Maunalei. Drydock for survey: Kentuckian. Misc. repairs: City of Los Angeles, Nordanger, Silveroak, Port Saunders, Phoenix, Thos. P. Emigh, Sacramento, Hercules, San Rosendo, Sylvan Arrow, Regulus, Traveler, Taiyo. Restless, Argyll, Nora, Adventurer, Glenmore, Point Arena, Maunganui, California, Sinaloa, Bolivar, Manchuria, Point Gorda, Makua. Seeconk.

COLLINGWOOD SHIPYARDS, LTD., Collingwood, Ontario

Tail shaft examination, stern bearing relined, rudder repairs: stmr. Laketon. Tail shaft inspection; hull caulked: tug Gargantuan.

HOWARD SHIPYARDS & DOCK COMPANY

Jeffersonville, Ind.

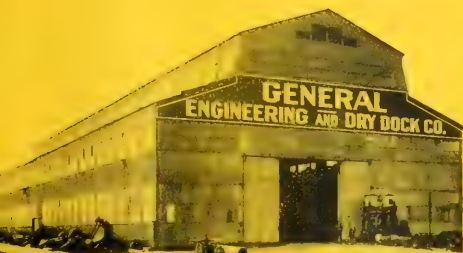
Installed centerline bulkheads: cross bulkheads; deck beams, plating; bulkhead plating welded, etc.; all bulkheading made oil-tight; new hatches installed; two barges for American Barge Line; one delivered Aug. 16, the other Oct. 1.

U. S. NAVY YARD Bremerton, Wash.

Misc. repairs and docking: Tennessee, Kanawha, Doyen, Kennedy. Miscellaneous betterments and repairs: Lexington and Saratoga. Misc. repairs incident to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotoyomo.

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Who did What - - and How



Captain S. Nagao

The Bordeaux Maru, one of the crack vessels of the "K" Line's Kawasaki North Pacific express service, achieved a remarkable

record in making the trans-Pacific run from Yokohama to Port Townsend in eleven days, 55 minutes. Captain S. Nagao, master of the vessel, thereby breaks the former voyage record by two days. The Bordeaux Maru brought a general cargo, including a heavy tonnage of raw silk, for discharge at Seattle.

The steamer is powered by a Brown Curtis impulse turbine with double reduction gearing. She develops a maximum speed of 16 knots. Her chief and first assistant, H. Satof, and M. Konishi, were enthusi-



Chief Engineer H. Satof



"K" Liner "Bordeaux Maru"

astic over the performance of the power plant, and state that Shell lubricants used in the engine room functioned with thorough satisfaction. Honors for this record run are shared by the Captain and the engineers for setting a new standard of navigation and engine-room efficiency.

The Steamer Golden Forest of the Oceanic & Oriental Navigation Company, owned and operated by Matson, arrived in San Francisco September 24th from New Zealand. The chief engineer, Mr. K. Townsend, states that they had a very bad stretch of weather in Cooks Strait between Nelson and Timaru, New Zealand. However, the rest of the trip was fine. Mr.

K. Townsend is well known on the waterfront.



K. Townsend

The steamer Golden Forest is operated by a 2500 horse power General Electric double reduction geared engine. Shell turbine oils are used exclusively on this vessel with great satisfaction to the engine department.

S.S. Marsodak, owned by Charles Nelson, sailed from San Francisco to the east coast September 13th, after being in dry dock for more than a month. Shell turbine oil went in the system before she sailed. The chief engineer is Mr. Snively.



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

One of the most popular of the younger generation of engineers that sail into California ports is **R. W. Ritchie**, first assistant engineer, aboard the motor-driven Panama-Pacific liner *California*. There's nothing strange in the fact that Ritchie decided upon marine engineering as a career. His father and grandfather were maritime engineers, when motive power as a means of propulsion was more or less derided by the "old school."

The camaraderie that exists among the "below deck gang" aboard the *California* was explained tritely by Chief Engineer Ernest Prince as "All For One; One For All" for the efficiency of the new ship.

Dull care was wafted on the ebb tide on Saturday night, October 27, when five hundred members of the annual steamship executives "boarded ship" and made merry around the festive board. The party of steamship leaders was held in the Palace Hotel.

John C. Rohlfs, marine manager of the Standard Oil Company (Calif.) and one of the best known maritime experts on the Pacific Coast, presided as toastmaster.

The "Crow's Nest List" was headed by **W. J. Edwards**, vice-president of Norton Lilly & Co., one of the organizers of this annual event.

When **Captain J. W. Troup**, superintendent of the British Columbian Coastal Services of the Canadian Pacific Steamship Company recently retired from active service, he climaxed a steamboating experience of over sixty years on Pacific river and coastal waters.

Born in Portland, Oregon, in 1855 and beginning his steamboating career as a very small lad on a



Three jolly mariners of the North German Lloyd motorship *Saale*. Left to right: Captain Richard Daniel; Chief Engineer Ludwig Krause; First Officer Adolph Kutzer. These three acted as hosts to a number of small parties of San Francisco shipping men interested in this new German motorship.

coastwise steamer owned and navigated by his own grandfather, Captain James Turnbull, Troup became master at the age of twenty, after filling every seafaring position from deckhand to first officer.

After 20 years of experience on the *Columbia River*, Captain Troup, in 1883, became associated with Captain John Irvine on *Frazer River* navigation. Their interests were taken over the following year by the Canadian Pacific Navigation Company, with whom Captain Troup worked till 1886, when he returned to Portland as marine superintendent for the *Union Pacific Railroad*. In 1892 he returned to the *Frazer River* steamboating, and in 1895 again became a superintendent

for the Canadian Pacific Navigation Company. In the service of that company and its successor, the Canadian Pacific Steamship Company, Captain Troup, with keen foresight built up the present Puget Sound and Coastwise shipping services of the Canadian Pacific from a fleet valued at \$400,000 to an investment of over \$8,000,000 in vessels and over \$3,000,000 in terminals and buildings ashore.

A notable and romantic marine engineering career was brought to a close with the recent death in Auckland of **William Laird**, retired superintending engineer of the Northern Steamship of New Zealand.

Laird was born in Dundee, Scotland, in 1840, came to America in his infancy, and served his apprenticeship in the Delamater Iron Works, New York, at the time that famous old plant was building the turret and gun mounting mechanism for Ericsson's Monitor.

In 1862 Laird's mother inherited the New Zealand sheep run of her brother Robert Fyffe, who was drowned at sea. The family then moved to New Zealand where, after selling the property inherited by his mother, William Laird entered the service of the New Zealand Steamship Company as chief engineer of the steamship *Rangitara*. After a time he reengaged in farming and later in mining.

In 1872 Laird moved to Auckland. There he established, with the late Captain McGregor, the beginnings of the present Northern Steamship Company. Of the original shareholders in that concern, Laird was the last survivor. He retired in 1909, after 36 years in the company's service. Just prior to his death, he laid claim to the title "Oldest marine engineer in New Zealand."

A record run was made recently from Seattle to San Francisco by the motorship *Admiral Perry*. When the vessel was off North Head a message was received by Chief En-

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*S.S. Colombia.....	Nov. 8	Nov. 10	*S.S. Ecuador.....	Oct. 18	Oct. 28
†S.S. Corinto.....	Nov. 15	Nov. 15	†M.S. City of Panama...	Oct. 29	Oct. 29
*S.S. Ecuador.....	Nov. 22	Nov. 24	*S.S. Venezuela.....	Nov. 1	Nov. 11
†M.S. City of Panama..	Nov. 29	Dec. 1	*S.S. Guatemala.....	Nov. 15	Nov. 25
*S.S. Venezuela...	Dec. 6	Dec. 8	†M.S. City of S.F.....	Nov. 26	Nov. 26

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Anapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York.

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gineer Fred Jackson that an eight pound boy had been born to Mrs. Jackson in San Francisco.

Upon receipt of the message the engines of the Admiral Perry started turning the propeller in a manner that surpassed all previous records. The vessel arrived in San Francisco eight hours ahead of time, and as soon as the lines were fast, Chief Jackson was breaking all speed records to the hospital.

Fred Jr., the first arrival in the Jackson family, was christened. Chief Jackson is well-known in Pacific Coast maritime circles, having been on the Boobyalla and the Chel-lamba, before going as master of the propulsion department of the Admiral Perry.

Chief Engineer Peterson of the Panama Mail liner City of Panama no doubt holds the record for names in Pacific shipping. His full name is Fritz Oscar Harry Peterson. He stated that his parents were besieged by numerous uncles to have him named after them, so they selected three of his uncle's and gave him their names.

"I used to become confused when I was a boy," stated the genial chief. "My folks simply called me Fritz. However, whenever any of my uncles came they always called me by their name, and at times I was in a quandary as just what my name was."

Chief Peterson was first assistant on the City of Panama from the time the vessel arrived here from European yards until the resignation of Chief Engineer Eniar Lindquist a year ago, when he was appointed head of the engineering department of the vessel.

Due to the increased popularity of motor-boating in Europe, the **International Mercantile Marine Company** announces that these small pleasure craft may now be shipped the same as automobiles. The arrangements were made following so many demands of European-bound tourists who desired to take their pleasure boats with them on their pleasure jaunt across the Atlantic.

Over the waters of San Francisco bay which he sailed for more than twenty-five years, the ashes of **Captain John T. Jones** were scattered, following his death recently.

Known affectionately as "Admiral Jones" to thousands of commuters, Captain Jones had sailed



C. E. Carlson, fire chief of Tacoma, who recently persuaded that city to build a modern fireboat.

on nearly every ferryboat in the Southern Pacific service.

In conformity with the clause in the Merchant Marine Act, 1928, that a stated percentage of the crews of American flag vessels enjoying mail subvention contracts from the Postoffice Department, be American citizens, the **Dollar Line** has begun to discharge the Oriental personnel employed on its vessels in the deck departments and fire rooms. The first vessel effected was the steamship **President**



Captain William Braaten of the Tacoma Fire Department, had much sea experience in his younger days, and is now keenly interested in the new Tacoma fireboat.

Adams. All liners in both the Oriental and the Round-the-World services will take on the new proportion of American personnel as fast as the vessels arrive at San Francisco.

Steamship companies and allied industries have been appealed to for cooperation in a campaign being fostered by the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union of San Francisco to preserve life at sea and on the piers. Safety measures will be extended to all ships sailing from the port, according to the plans of **Byron O. Pickard**, safety engineer for the three organizations.

Pickard, after a period of eighteen months work along the San Francisco waterfront to reduce the number of accidents, has attained surprising results, reducing the toll of deaths and of loss time accidents among stevedores and seamen, which has been mounting steadily with the passing years. Pickard announced that committees are working to bring about the cooperation of forty steamship lines at present operating out of Pacific Coast ports.

Due to increased business activities of **Sudden and Christenson**, San Francisco, the company was forced to move its offices from 230 California street to 310 Sansome street. An entire floor will be occupied.

The **Transmarine Lines** are now established in their new and larger quarters in the Financial Center Building, 405 Montgomery street, San Francisco.

Major Charles L. Tilden, president of the Board of State Harbor Commissioners, and Paul Sharrenberg and Frank M. Sykes, commissioners, have been complimented by having three vessels recently launched for the Harbor Board at San Francisco, named in their honor.

Surprising his many friends afloat and ashore, **Captain Charles Swanson**, veteran master of the Admiral Line coaster **Ruth Alexander**, took unto himself a bride, who, was formerly Mrs. Ethlyn Adelaide Curtis. Following the wedding, Captain Swanson made one trip on the **Ruth Alexander**. He announced that he has retired from the sea after forty years service.

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According to advices from Europe, **Workman, Clark, Ltd.**, of Belfast, have received instructions to commence the building of what is declared to be the largest oil tanker to be laid down anywhere in the world. The vessel is said to be 600 feet long with a gross tonnage of 18,000 tons. The advices stated that the builders have refused to divulge by whom the contract was let.

Friends along the Pacific Coast were grieved to learn of the untimely passing of **B. L. McMullen**, widely-known in Pacific Coast shipping circles, who passed away in Portland after a brief illness. Mr. McMullen had been connected with Pacific Coast shipping for many years. He was at various times identified with **Dodwell & Co.**, the **Border Line**, the **Pacific Steamship Company**, **Pacific Lighterage Co.**, and was several years district manager for **Sudden & Christenson**.

James Griffiths & Sons of Seattle have purchased the 8800-ton freighter **Delight** from the United States Shipping Board. The sale price was not revealed, but it was unofficially reported that the cargo carrier was secured at an attractive figure.

A record shipment of passenger automobiles was sent to Peru and Chile as part of the cargo of the new motorship **Santa Barbara**, when that vessel sailed from New York recently on her maiden voyage. The **Santa Barbara** and her sister ship the **Santa Maria** are the largest motorships flying the United States flag.

Only 18,400 tons of sailing vessels are now under British registry, according to the eighth annual report of the **British Sailing Shipowners' Association**. This is out of a world total of 1,029,000.

Succeeding **P. M. Holway**, who recently resigned to accept another position, **George R. Nowlin**, formerly assistant traffic manager of **Furness, Withy & Co., Ltd.**, at Chicago, has been appointed traffic manager for the line at San Francisco. Nowlin comes to the Pacific Coast with a notable record in the services of **Furness, Withy & Co.**

The Shipping Board has rejected the plan of the **Emergency Fleet Corporation** to consolidate government operated shipping services. The plan was held unfeasible in view of the fact that sale is con-



R. W. Ritchie, first assistant engineer, Panama Pacific liner California.

templated of the United States Lines and the American Merchant Line and also because the policy of the Board is to place the individual lines in private hands as fast as possible.

Harold de Golia, who represented the **Matson Line** at Los Angeles for several months, has resigned his post to join the Los Angeles banking fraternity. De Golia is now affiliated with the travel bureau of the **Citizens' National Bank** of the southern city. Before going to the **Matson Line** De Golia was connected with the old **Oceanic Steamship Line**.



Chief Officer Adolph Gutheke of the Hamburg-American motorship Los Angeles, a popular officer and a great Pacific Coast booster.

L. C. Stewart, head of the lumber department of **Sudden & Christenson**, has been named temporary chairman of the intercoastal lumber conference to succeed the late **James P. Jennings**, who recently passed away in San Francisco.

Four **Shipping Board** tankers have been sold to private owners, recent advices from Washington announced. \$1,156,360 was the price paid for the vessels. The **Salina**, **Stockton**, **Darden**, and **Gladeye** were the vessels disposed of, the first two being well known at Pacific Coast ports having been laid up here for several months along with the tankers **Dilworth** and **Meton**. No bids have been received for the sale of the tanker **Brandywine** and dispatches from Washington indicate that the vessel is soon to be re-advertised for sale.

William A. Robertson, who for the last seven years has been terminal superintendent of the **Luckenbach Line** at Los Angeles has left for New York to assume a position in the Eastern offices of the company. He has been succeeded in the Los Angeles office by **Ray Duncan**, who has been assistant superintendent.

Two youths who started their seafaring careers together twenty-five years ago out of Germany are shipmates now for the first time aboard the crack **Hamburg-American** motorship **Los Angeles**. They are **Chief Officer Adolf Gutheke** and **Chief Engineer Henrich Gramberg**. They attended the same school in Bremen and each launched upon a maritime career at the same time, however, until the launching and placing in commission of the new motorship **Los Angeles** they had never sailed together. **Chief Engineer Gramberg** has sailed continuously with the **Hamburg-American Line**. He supervised the installation of the engines on the motorship **Los Angeles** as well as the **San Francisco**.

This month two **Shipping Board** vessels will leave Seattle lumberladen on their last voyage under the American flag. They are the 8800-tonners **Alloway** and **Iconicum**. They were sold by the Board to Japanese interests and will transport the lumber for the account of the **Canadian-American Shipping Company**.

The keel for the third new liner of the **Panama Pacific Line** was

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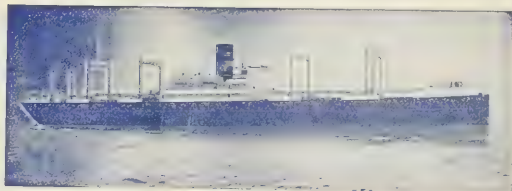
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laid down at the yards of the Newport News Shipbuilding and Drydock Company in the presence of high officials of the company and national leaders on October 1. Company officials are considering naming the new vessel New York. This vessel will be a sister ship to the California and the Virginia. The latter is due to sail from New York for the Pacific Coast on December 8. The three vessels represent an expenditure of approximately \$8,000,000 each and are the largest vessels of their class ever built in an American shipyard.

With the sailing of the liner **Manchuria** from California to New York on October 1 in the regular service of the Panama Pacific Line, another of the oldest ships in this trade passes out of the picture as far as this run is concerned. The vessel has been purchased by the Dollar Line and upon her return to the west coast will be laid up and reconditioned as a "standby ship" for the Oriental service whenever needed by the Dollar Line.

October will be a record month and reports of the various lines will show unprecedented activity, according to **J. R. Fitzgerald**, freight traffic manager at San Francisco, for the American-Hawaiian Steamship Company, speaking of the intercoastal traffic. Fitzgerald does not stand alone in this statement. Representatives of all lines declare that business up to the beginning of November is tremendous.

Sale of the tankers **Pearl Shell**, **Gold Shell**, and **Silver Shell** to a Dutch Oil Company was completed by the **Shell Company**. There has been a heavy demand by foreign interests for American tankers during the last year, resulting in a marked decrease of American tonnage of this type.

There is danger of a strike the first part of this month among **German shipyard workers**, which, if carried out will effect 50,000 men, according to advices received here. During the month of October strenuous efforts were being made to avert the threatened trouble. The agreement between workers and employers terminated the end of October.

Portland, Oregon, is the chief wharf shipping port of the country, according to statistics compiled by



Captain Alda Beltrami, chief officer of the motorship **Cellina** of the **Libera Line**, for which the **General Steamship Company** of San Francisco is agent. This is said to be the finest growth of whiskeys entering San Francisco Bay.

the United States Department of Agriculture. Duluth and Superior ranked second for the year ended June 30, 1928. More wheat left the United States through the Portland customs district than any other district during this period, the report disclosed.

The gallant old sailer **S. F. Telmie** that proudly sailed for many years to various parts of the world out of Pacific Coast ports is to be converted into a fish curing plant. More than \$20,000 is to be expended on the fine old barkentine. Her masts will be cut down to derrick length and her deck and holds remodeled. The vessel will serve **Nelson Bros, Victoria**.

In an effort to revive the British Columbia coal industry, a protest has been made against the contemplated conversion of vessels on the Pacific Coast operated by the Canadian National Steamship from coal to oil. The protest was filed by **Federal Minister of Mines McKenzie**. The matter is now under consideration by **Sir Henry Thornton**, president of the Canadian National Railways.

C. J. Ballard, district freight manager for the **American Mail Line**, has fully recovered from a recent operation and is now back on duty in the Portland offices.

W. T. Morgan, manager for the **Yamashita Company** in Portland, has been appointed freight agent

for the company at Seattle. He was succeeded by **S. E. Semple**, who has been with the Japanese company for many years.

The **Dollar Steamship Line** has been refused a review by the U. S. Supreme Court to test out its liability when its steamship **Melville Dollar** collided with the **Matson Navigation Company's** steamer **Mauna Ala** in April, 1925, north of **Cape Blanco, Oregon**.

Representatives of a company known as the **National Navigation Lines** of Mexico announced at San Diego recently that a fortnightly service from the southern port to west coast Mexican ports would soon be started and also stated that numerous shipments of **Imperial Valley cotton** had already been booked for shipment to **Manzanillo**.

Cyrus Anderson, well known along maritime row in San Francisco, has been appointed agent at that port by the **Overseas Railways, Inc.** with headquarters at New Orleans. The company will inaugurate, in December of this year, a new car ferry service between New Orleans and Havana, employing a new type of car carrying vessel.

The tenth passenger or freight ship launched for the **Canadian Pacific** in twelve months was a recent event at the **Fairfield Shipbuilding Company** on the Clyde. The vessel was the **Princess Norah** and will be used in the British Columbia coastal service. The ten vessels include four "Duchess" class passenger liners, five "Beaver" class freight ships, and one passenger vessel.

E. R. F. de Lanoy, Pacific Coast manager for the **Holland-America Line**, announced the appointment of **Ralph R. Squillace** as northwest passenger agent. He will have jurisdiction over Washington, Oregon, Idaho, and British Columbia districts, with his headquarters in Seattle.

John E. Wynn, local inspector of the U. S. Steamboat Inspection Service at Portland, Oregon, spent his annual vacation in San Francisco. Mr. Wynn likes the Golden Gate City very much indeed and was welcomed by a host of friends who are always glad to have him in California.

FOURTEEN "14" VESSELS

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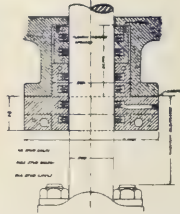
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ALAMEDA	3,118	DERPERE	3,474
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CORDOVA	2,273	DENALI	3,474
LAKINA	2,273	NABESNA	2,451
LATOUCHE	2,332	KETCHIKAN	2,373
		Total	50,843

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Trade, Traffic, and Shipping

(Section continued from Page 507)

dise, machinery, automobiles, and other products are being absorbed. Despite the welter and complexity of religious differences, social problems, and the political turmoil, progress in many activities affecting economic growth are evident. One has only to ride across the country by rail to realize that scarcely even the surface has been flecked or scratched in this forward movement. So much remains to be done before India will even begin to compare with modern western nations in the manner of life of her people, that one's powers of imagination cease to function when attempting to estimate the possible effect upon trade movements when that development affects in a more general and vital way her entire 320,000,000 of people.

We can do no more than speculate, as in our calculations with regard to China, but it is a reasonable prospect that our trade there may not only hold its present volume but show substantial steady increase in the years of the immediate future. The fact that India's foreign trade has almost doubled in 12 years time would appear to indicate progress in the country and bear out these expectations for the future.

We purchase approximately 50 per cent more value of goods from India than we sell. Our big sales to India are machinery, electrical equipment, petroleum products, automobiles, and iron and steel; while our purchases are chiefly of staple products such as jute and bags (\$78,000,000 last year), goat skins (\$14,000,000), shellac (\$9,000,000), castor beans (\$3,000,000), carpet wool (\$3,000,000), tea (\$3,000,000).

Our trade with India in recent years is following direct routes instead of being transhipped in the United Kingdom as was the case before the great war. Direct contact is making for a better understanding of trade conditions there.

Australia

Australia is our largest automobile and gasoline market in the Far East. Up until recently Australia has been the largest foreign market for American automobiles. Last year the gasoline sales we made totalled \$15,000,000; while automobiles and accessories ran to \$46,000,000. Our machinery and electrical equipment sales last year ran to a total of \$23,000,000, of which \$8,000,000 were electrical, \$5,000,000 agricultural, and the balance miscellaneous machinery items. Next to Japan, Australia is our most attractive single lumber and wood products outlet on the other side of the Pacific, taking \$10,000,000 worth last year or about half the volume absorbed by Japan. California redwood comprised about one-quarter of this figure, while Douglas fir ran to \$5,000,000 in value.

In addition to Australia being a large, sparsely populated continent with comparatively rich resources, the scale of living is comparable to our own, and it is not therefore surprising that her 5,800,000 people, almost, if not actually, related to us in flesh and blood, and politically stable, should offer a better market at present than China's vast millions. Our total sales to Australia last year amounted to \$159,000,000 or \$50,000,000 more than our sales to China. Australia ranks second, following Japan as a transpacific market for American products.

New Zealand

Only slightly over 103,000 square miles in area and with a population similar to that of Australia but only about 1,300,000 in number, New Zealand is even more important to us as a sales outlet than the Netherlands Indies with 25 times the population and five times the area. Our sales to New Zealand totalled \$32,517,000 last year and consisted of mineral oils, automotive products, machinery and electrical equipment, iron and steel, lumber, leather, paper, cotton goods, and a miscellaneous range of other manufactured articles. A prosperous condition of the people makes New Zealand a good market for the better grades of American automobiles.

Summary

Summarizing in a general way our trade relations with transpacific areas, we are dealing with a billion people, or more than half of the world's population. These areas are important to us as a source of supply of the materials for our industries, the rapid development of which has increased nearly seven times our purchases from transpacific sources in 15 years time. We now buy almost \$2,000,000,000 worth annually in that area, our purchases far exceeding our sales. In the same period our sales to that entire area have almost quadrupled.

So far, it appears, the Atlantic ports of the United States handle the bulk of the traffic with these Far Eastern countries, but with the extension of industries generally on the Pacific Slope and increased production with the growth of population in the coast states it would appear entirely logical and the natural course of events that the Pacific ports will grow in importance in handling Far Eastern trade. The expansion in our own Pacific tonnage since the war, the improved character of the ships of all nationalities engaging in transpacific trade through West Coast ports have already contributed to the prosperity of these ports. There is every reason to expect that the future will witness further prosperity for the entire Pacific Coast region of the United States by virtue of our growing trade with the Far East.

California's Fish Crop

CANNED, smoked, and dried fish to the value of \$23,348,516 was produced by canners and packers in California during 1927, according to the State Fish & Game Commission.

The packing plants involved number 75, valued at \$8,606,383, and employed 6461 people.

The total canned pack included in the above valuation was 3,882,900 cases of which 2,620,412 cases were sardines. San Pedro district was responsible for 1,916,422 cases of canned fish, and Monterey district for 1,398,782 cases.

In addition to this huge total of canned, smoked, and dried fish, the canneries and packing establishments turned out, as by-products, 263 tons of fish flour, 21,111 tons of fish meal, and 2,618,490 gallons of fish oil.



The Fastest, Finest Way to Hawaii

Of course you're going to Hawaii! And the way to go is on the swift and luxurious Malolo, sailing from Portland November 9 on her special voyage to Honolulu and Hilo, carrying representatives of Oregon and Washington chambers of commerce on the Pacific Northwest Cruise-Tour to Hawaii. The Malolo will resume her regular service from San Francisco to Honolulu on December 29, sailing that day and every other Saturday thereafter. Other Matson liners sail every week from San Francisco for Honolulu during November and December, as usual. To the South Seas and Australia, every 21 days.

The Malolo speeds to Honolulu in four days—saving nearly two days—and enabling you to enjoy cosmopolitan San Francisco. This splendid ship is one year old this month.

Discriminating travelers prefer the Malolo because of her newness—her style and size—the smartest ship serving Hawaii. A telephone and reading lamp at head of each bed. An entire deck for luxurious public rooms and motion-picture theatre. Another deck exclusively for sports and promenade. Pompeian swimming pool, gymnasium, children's playground on the sun deck, electric thermal baths, elevators. Meals that delight the most fastidious.

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Freight, Charters, Sales

October 13, 1928.

THE following grain fixtures have been reported from the North Pacific to U.K.-Continent: British m.s. King James, 29/-, Oct., options 28/6; a Ropner str., 29/6, Dec.; a Ropner str., 28/3, Oct.; a str., 29/6; Oct./Nov.; British str. Cragpool, 28/3, Oct.; a str., 29/-, options 29/6, Nov., Earle Stoddard & Clayton; Spanish str. Alfonso Perez, 31/-, Dec., L. Dreyfus & Co.; a King str., 29/-, with options 28/-, Nov.; a steamer, 29/6, Nov., Earle Stoddard & Clayton; German str. Taifun, Nov., L. Dreyfus & Co.; a Ropner str., 29/6, with options 30/6, Jan.; British str. . . . Worth, 29/6, Dec.; British str., 30/-, Oct.; Japanese str. Egypt Maru, Oct., Continental Grain Co.; British str. Jersey City, 29/-, Oct.; Japanese str. Ohio Maru, 30/3, Oct., Continental Grain Co.; a K Line str., 30/-, L. Dreyfus & Co.; British str. Orient City, 28/- (relet), Oct., James Stewart Grain Corp.; British str. Rio Dorado, Nov., Balfour, Guthrie & Co.; a str., 31/3, Nov.; British str. Clearton, 29/6, Nov.; British str. Wentworth, 30/-, Nov. Strauss & Co.; British str. Tiber-ton, Oct., L. Dreyfus & Co.; British m.s. King Malcolm, 29/-, Nov.; a Japanese str., 30/-, Nov., Kerr Gifford & Co.; Swedish str. Sagoland, 28/6, Nov.; a British str., 28/6, Nov./Dec., option Shanghai \$4.50; a str., 30/-, Dec.; a str., 30/-, Oct./Nov.; a Ropner steamer, 29/-, January, J. W. Mitchell; Japanese str. Yaye Maru, Nov.; British str. Madras City, Oct., Kerr Gifford & Co.; Japanese str. Yuri Maru, 28/6, Nov., Canadian Cooperative Wheat Producers.

The following steamers are reported fixed with wheat from Vancouver to the Orient: British str. Dalcairn, Shanghai, \$4.50, opt. U.K.-Continent, 30/6, Nov./Dec., L. Dreyfus & Co.; British str. Dalblair, Shanghai, \$4.50, Oct./Nov.; Japanese str. Kyokoh Maru, Shanghai, \$4.50, L. Dreyfus & Co.; British m.s. Larchbank, Calcutta, 30/-, Oct./Nov., same charterers.

The following lumber fixtures to Australia are reported: Japanese str. Bankoku Maru, North Pacific to two ports Australia, Oct., J. J. Moore & Co.; Japanese str. Havre Maru, 2 ports North Pacific to 2 ports Australia, \$12, Nov., American Trading Co.; Norwegian str. Kalfarli, three ports North Pacific to Australia, Nov., J. J. Moore &

Co.; Japanese str. Ida Maru, Puget Sound, to Sydney, \$11.50, Oct., same charterers.

The following steamers are reported fixed from the North Pacific to the Orient: Japanese str. Seisho Maru, Columbia River to Japan, \$7.50, Sept., J. M. Allen; Japanese str. Etna Maru, Grays Harbor and Columbia River to Yokohama and Osaka, Oct./Nov. (owners' account); Japanese str. Clyde Maru, North Pacific to Japan, Oct., Grays Harbor Exportation Co.; American str. Alloway, Puget Sound to Japan, Nov., Can. American Shipping Co.; American str. Iconicum, same.

The American str. Henry D. Whiton is reported fixed from Coos Bay, Puget Sound and Columbia River to North of Hatteras, \$13, Sept./Oct. loading, by Blanchard Lumber Co., and the American m.s. East Indian, from British Columbia to North of Hatteras, Nov. loading, by Seaboard Lumber Sales, Ltd.

The British str. Indian City is reported fixed from the North Pacific to U.K.-Continent with wheat and lumber, at a lump sum of £13,000, by W. L. Comyn & Co.; and the British str. Comeric from Vancouver to U. K.-Continent, wheat and lumber, lump sum \$14,000, Oct./Nov., by Canadian American Shipping Co.

The British m.s. King Stephen is reported fixed from the North Pacific to South Africa, lumber and merchandise, Oct./Nov. loading, by J. J. Moore & Co., and the Japanese str. Yoko Maru, Puget Sound and British Columbia to South Africa, lumber and merchandise, Nov. loading, same charterers.

The following miscellaneous fixtures are reported: British str. Benclench, North Pacific to U. K.-Continent, general cargo, \$1.40, Oct., Furness Withy & Co.; British str. Kirnwood, North Pacific to Genoa, lumber and merchandise, Oct.;

Canadian-American Shipping Company and British str. Pilar de Larinaga, North Pacific to Antwerp, lumber and merchandise, Oct. loading, same charterers.

The following tanker fixtures are reported: American tanker George W. Barnes, California to North of Hatteras, 68c, Oct., clean; American tkr. Trimountain, California to North of Hatteras, 50c, Oct., dirty; American tkr. Hadnot, San Pedro to Boston, 78c, Oct.

The following time charters are reported: Danish m.s. Indien, British Columbia to North of Hatteras, Sept.; American str. Agwidale, North Pacific to North of Hatteras, lumber, Oct., Shepard & Morse Lumber Co.; a steamer, North Pacific to U. K.-Continent, \$1.30, Oct.; British str. Benroch, Pacific trade, \$1.45, delivery Nov., Canadian-American Shipping Co.; Norwegian m.s. Austvard, 6 months, delivery North Pacific, redelivery Orient, 7/-, Nov.

The following sales are reported: American str. Viking, George E. Billings to James Rolph III.; British m.s. Coal Harbor, to Chas. H. Rogers of Los Angeles; American str. Viking (flag changed to Philippine), Meyer Muzzall to Inter-Island Steamship Co., Manila; American str. Manchuria, International Mercantile Marine Co. to Robert Dollar Co.; American str. Delight, United States Shipping Board to James Griffiths & Son; American tkr. Salina, reported \$352,000, United States Shipping Board to Gladstone Transportation Co., Baltimore; American tk. Stockton, reported \$249,650, same; American str. Lurline, Matson Navigation Co. to Alaska Packers Assn.; American str. Annette Rolph, reported, \$3600, U.S. Marshal to J. B. McDonald; American str. Alloway and Iconicum, U.S. Shipping Board to Japanese parties.

PAGE BROTHERS, Brokers.

World Shipping News

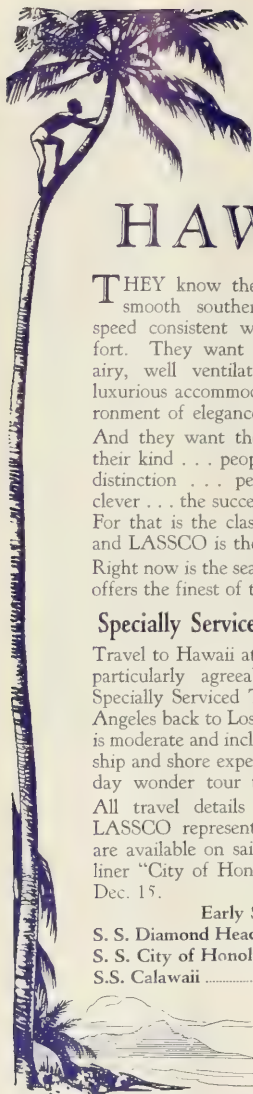
During the past five years the ocean export of bulk wheat from Vancouver, British Columbia, has increased more than 50 per cent; and in 1927-1928 reached the enormous total of 80,282,000 bushels.

About a million and a half dollars will be spent during the next four years in deepening and enlarging the Arabian port of Aden.

During the year ending June 30,

1928, the port of Honolulu entered 9,708,000 tons of shipping, an increase of 18 per cent over the previous year.

Shipping in the upper Yangtze River is still moving under the protection of armed guards. The continual efforts to boycott Japanese shipping on the river are said to have caused about 50 per cent loss in freight carried by the river steamers.



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The Hamburg-American Line has inaugurated a direct service for Central America to Amsterdam and Hamburg coffee delivery. Four motorships, the *Phoenicia*, *Phrygia*, *Palatia*, and *Patricia*, are being used for monthly sailings, which started September 15. These vessels are of 5400 tons deadweight carrying capacity and 13 knots speed.

The Belgian corporation known as the East African Shipping Agency has recently been established with headquarters at Beira. This is a combination of three agencies that controlled the majority of the shipping entering Beira.

A daily airplane service for mail and passengers has been established recently between Buenos Aires and Montevideo. Three seaplanes are used, each with a capacity for four passengers and limited quantity of package freight and mail. At both ends of the route the planes land at the waterfront.

The river boat movement at New Orleans showed a healthy increase in the fiscal year ending August 31, 1928, as compared with the previous twelve months. In the 1927-28 period, arrivals of river craft of over 25 tons reached a total of 3066 vessels aggregating 1,149,377 tons. As compared with the totals of 2445 vessels and 977,316 tons for 1926-1927, this shows increases of 20 per cent in the number of boats and 17 per cent in tonnage.

Banana imports by sea into New Orleans during the last fiscal year reached the amazing total of 22,946,796 bunches. A bunch will average 180 bananas. Figure it out for yourself! New Orleans last year took in about one bunch of this luscious tropical fruit for every family in the United States; or, to be exact, 34½ bananas for every man, woman, and child of our population. "Yes, we have no bananas?"

The Moore & McCormick Steamship Lines have recently established a new service between New Orleans, Buenos Aires, Montevideo, and Bahia Bianca. Sailings began on August 15, with the clearance of the steamship Commercial Guide, and will continue at monthly intervals.

For the fiscal year ending June 30, 1928, the Panama Canal established a new high record for com-

mercial vessel transits and for tolls collected. The totals are 6456 transits and \$26,944,499.77 in tolls collected. About 6 per cent increase in transits and 3 per cent increase in tolls, as compared with 1927. A loss in bulk oil traffic in the first six months of 1928 was offset by heavy movement of Canadian grain.

The service of the Westfal-Larson Line between Pacific Coast ports and ports of the east coast of South America is to be augmented by the addition of three 14-knot motorships designed especially for this trade and now building in England. These vessels will be of 9000 tons deadweight capacity and will have refrigerated space for 1500 tons measurement. Comfortable accommodations will be provided for ten to twelve passengers.

The liner *Leviathan*, one of the two largest ships in the world, recently completed her fifth year in the "Transatlantic Ferry" service of the United States Lines of the Shipping Board. During this time she carried 166,000 passengers across the pond, with no passenger casualties. Her record booking was in July 1927, when she brought home to New York 2741 passengers.

The Canadian Pacific Steamship Company now has building at the Clyde yards of the Fairfield Shipbuilding Company a fine passenger liner for its Pacific Oriental services. The *Empress of Japan* is to be 622 feet long on the water line, 83 feet 6 inches molded beam, 46 feet 9 inches molded depth. High pressure, single reduction geared to bines of the Parsons type will develop 25,000 shaft horsepower and will drive her at 21 knots. She will be undoubtedly the finest passenger liner on the Pacific.

A remarkable improvement has developed during the past two years in the handling of bulk maize at Durban and Capetown, South Africa. The new elevator at Durban has a capacity of 42,000 tons, and shows remarkable dispatch in loading vessels. Maize in bulk can be loaded at the rate of 6000 tons in 24 hours, including trimming, and in bags it can be stowed at 1100 tons a day. Three years back there was no bulk grain handling in South Africa.

Shipping at Gdynia, the new port

of Poland, is increasing at a very rapid rate, and the port has more than 1500 men employed on the increase of facilities. The principal business is coal export, which accounts of 776,000 tons out of a total of 875,000 tons in the first half of 1928. Imports during the period totaled 95,000 tons.

A considerable program of improvement is under way at the old French port of Dunkerque. This includes a new entrance lock, which will entail the construction of a new jetty 2500 feet long on the west side and the extension by 2330 feet of the east side jetty, giving an entrance 900 feet wide and a new large water port, with a new tanker dock at its western end. There will also be a new turning basin 2200 by 1250 feet, with 26 feet depth of water. Sixteen new dock cranes and two new floating cranes will be installed.

Growth In Gasoline Export

WITH the sailing September 21 for Australia of the oil tanker *Bohemian Club* carrying a cargo of over 3,000,000 gallons of Union gasoline, the total gallonage of this California gasoline to clear Los Angeles harbor for Australasia during the past four months has passed the 15,000,000 gallon mark. Of this huge movement of Union gasoline, destined for motorists "down under," approximately 13,000,000 gallons were transported by tankers, the balance being made up of package goods for interior points of Australia.

Based on shipments by the Union Oil Company during the past four months, it is estimated that this company alone will ship to Australia and New Zealand an aggregate of 50,000,000 gallons of gasoline during the twelve months ending April 1929.

While an active competitor in the Australian market for several years, it is only in the last few months that Union has entered this field in a large way. To this end the Atlantic Union Oil Company Ltd., was formed as a marketing subsidiary, and large terminals were built at the leading ports in Australia and New Zealand. In addition to these, other bulk units have been and are being developed to provide wider distribution among the smaller cities and outlying districts.

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in satisfactory use!

The Newark Airport

THE metropolitan airport at Newark, which has been built with the aid and cooperation of the United States Department of Commerce and the most prominent experts in every branch of aeronautics, has been planned to serve the entire metropolitan district of Greater New York and North Jersey—the Greater Newark of the future. This territory includes a population of 10,000,000 people, of whom more than 2,500,000 are on the New Jersey side of the Hudson River. The Newark metropolitan airport will be the largest and most important grand central air station in the United States.

The Newark airport adjoins the municipal docks and ship basin at Port Newark, on the shore of Newark Bay, between Newark and Elizabethport. It fronts for nearly a mile on the concrete highway being constructed by the state to connect with the Holland tunnels under the Hudson river. This highway will be entirely free of grade crossings in the metropolitan district, and the airport will be only twenty minutes from Broadway by auto when this highway is completed. With the building of other highways in progress, it will be within a forty minute drive of any part of the North Jersey metropolitan district or of Staten Island. Several new highways and viaducts are being built to make the airport and seaport easy of access from all parts of Newark.

When completed, the Newark airport will cover an area of 500 acres of what was formerly salt marsh. The first section of the airport, to be opened at once, includes approximately 160 acres, and dredges are now at work digging an additional ship basin at the city docks and pumping the silt to fill in the remaining part of the airport site.

Up-to-date municipal hangars are being completed by the city to house the planes of the air mail lines which will make the port their terminus, and also for passenger air lines as well as for other planes which may drop in for other reasons. Not a few business men of New Jersey and New York now use private planes to commute to and from their country homes, and provision will be made for parking space for these planes. An air mail postoffice building, a waiting room for air line passengers, and parking ac-

commodations for automobiles bringing passengers to the terminal or waiting for planes to arrive, will be other features of the port.

Another section of the field now under construction has been set apart for a mooring mast and landing space for dirigibles, and it is expected that the projected airship lines between this country and Germany and England will make the Newark airport their western terminal.

To make this flying field safe, the city has altered the course of two creeks, diverting them into sewers, and has put all wires and cables underground in the vicinity of the airport. All obstructions for a considerable distance around the field

are marked with red lights, and the field itself is outlined with lights and brilliantly illuminated at night by floodlights, to facilitate night arrivals and departures.

Careful meteorological surveys of the location of the Newark airport covering a period of years showed it to be practically free from fog. Dust which might make landing difficult has been eliminated by sodding the double runway, built in the shape of a Maltese cross, 600 feet wide and half a mile long, and this turf will be rolled and mowed and kept in as fine condition as a golf course. In the centre of each runway there is a take-off strip 200 feet wide, of cinders rolled hard and saturated with asphalt oil.

Motorship Saale

(Continued from Page 497)

sary for cylinder cooling is taken from the first stage and only what is used for piston cooling is passed through the second stage. The capacity of each pump is 880 gallons per minute against an 80-foot head for the first stage and 220 gallons per minute against a 160-foot head for the second stage. Each pump is direct-connected to a 55-horsepower 1000/1400-revolutions per minute motor.

There are two lubricating oil pumps, one a spare, each driven by a 15-horsepower 950-revolutions per minute motor. These pumps deliver the bearing oil from the sump tank and through coolers to a 1325 gallon overhead tank from which it flows to the bearings. A third electric driven lubricating oil pump serves as standby to the attached crosshead lubricating oil pump. There are two De Laval separators for cleaning of lubricating oil. For the handling of the fuel oil, filters are provided.

To take care of the refrigerating cargo space there are two carbon dioxide 2-stage motor driven compressors with motors of 30 horsepower each. For starting and maneuvering, compressed air at 450 pounds pressure is used, there being two starting air tanks carrying air at this pressure and ten high pressure 1000 pound storage tanks. The total capacity is sufficient for 48 engine reversals.

Of interest is the arrangement of the sump tank, which is located

in the double bottom. Between this tank and the skin of the ship is another tank for dirty lubricating oil. This arrangement insures against salt water leakage.

The electrical hookup is also very well thought out and every precaution is taken to prevent possible shutdowns of the main engine. The arrangement provided is such that the auxiliary engines are never put in parallel. For example, while at sea when two auxiliary engines are in service, one engine is furnishing power to one of the turbo-blowers and the other unit to the other blower.

With a daily fuel consumption at sea of approximately 120 barrels, this vessel represents a highly economical unit.

Thorkote Products

For insulating the steam pipes and boilers of the new Panama Pacific intercoastal liner Virginia, Thorkote is being liberally used on account of its high insulating qualities and its tough wearing surface which reduce maintenance expense to a minimum.

Plagemann and DeKalb of San Francisco are Pacific Coast representatives for the Thorkote Products Co., Inc. The Los Angeles Rubber and Asbestos Works are distributing for southern California; Galbraith & Co., Seattle, have the state of Washington; and McCracken & Ripley Co. of Portland cover the State of Oregon.

Oils You'll Know

Perfect lubrication for even the smallest Diesel

... are what you want, by every test for reliable quality and correct cost that you can make.

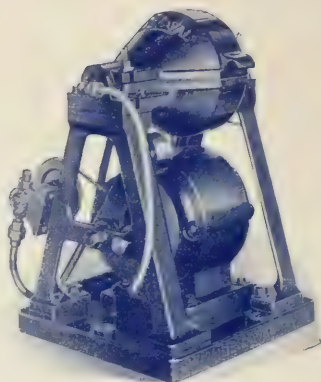
Since the days when coaling ships by hand began to go out of style, Associated engineers have been studying oils for marine use.

They are studying them now. Actual exhaustive tests in Associated laboratories result in products which meet the practical requirements of marine men. There is no guess-work in an Associated engineer's recommendation.

Through the years, this attention to marine lubrication and fueling demands has resulted in—

1. Bunker fueling facilities at Pacific Coast ports that fuel a ship without fuss or flurry and absolutely within the time set.
2. A delivery service of lubricating oil in drums and by tank trucks at Pacific Coast ports and at Honolulu and Manila that is complete to the last detail.
3. The development of oils for every type of marine work—specific oils refined to meet definite needs.

Performance records of knots steamed per gallon merit your investigation.



THE Horizontal Type De Laval Oil Clarifier provides a complete and highly efficient oil purification plant for use in connection with the lubrication of oil engine; of moderate power and other machines having similar lubricating systems; in other words, with units equipped with enclosed lubricating systems and of a type in which there is little likelihood of free water being present in the oil.

Its bowl is of the well-known De Laval disc construction, now almost universally employed in centrifugal machines designed for purifying or clarifying oils. This construction enables the full dirt-holding capacity of the bowl to be utilized without affecting the efficiency of clarification, and means that under average service conditions, the machine will need attention but two or three times weekly.

The Horizontal Type De Laval Oil Clarifier is highly recommended for use in small marine Diesel-engined power plants. In this service it will show every advantage of a larger De Laval on a larger vessel, reducing bearing wear and enabling the same oil to be kept in service indefinitely.

Write for full information on this new unit.

The De Laval Separator Company

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DE LAVAL PACIFIC COMPANY, 61 Beale St., San Francisco.

THE DE LAVAL COMPANY, Ltd.
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Types for Lubricating Oil and Fuel Oil

Pacific Marine Review

The National Magazine of Shipping

DECEMBER, 1928

AGE of INTERNAL COMBUSTION

ON LAND
AT SEA
IN THE AIR

M.S. SAALE
5000 S.H.P.
SINGLE SCREW

26
MOTORSHIPS
Single Acting
SULZER DESIGN

MAXIMUM
SIMPLICITY
ECONOMY

BUILT AND BUILDING
FOR
**PACIFIC COAST
SERVICE**

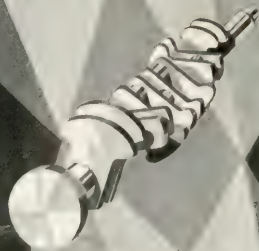
BUSCH-SULZER BROS.-DIESEL ENGINE CO.

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TWO RECTOR ST., NEW YORK - RIALTO B'LD'G. SAN FRANCISCO

Official Organ

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STERLING



◆ COMPARATIVELY ◆

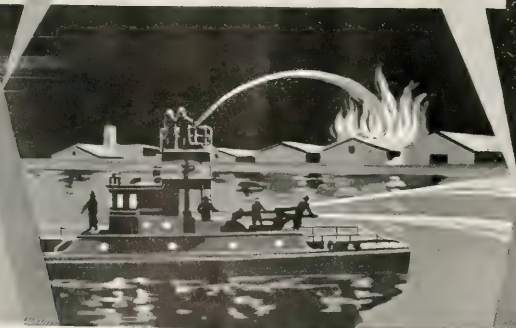
The initial price of a Sterling cruiser engine is about half that of a steam or oil engine of similar power. The difference in price of engine and the difference in cost of hull will buy all the gasoline you will use for years.

The lesser space occupied by the Sterling affords more state rooms. Why lose this space? The lesser weight and the increased power of the Sterling—twice the power of the steam or oil engine for a common size, generally increases the boat speed up to 50%.

A Sterling engine is safe. Much interesting data on these subjects is available on request. The comparison is interesting and valuable.

STERLING ENGINE COMPANY

BUFFALO, N. Y.



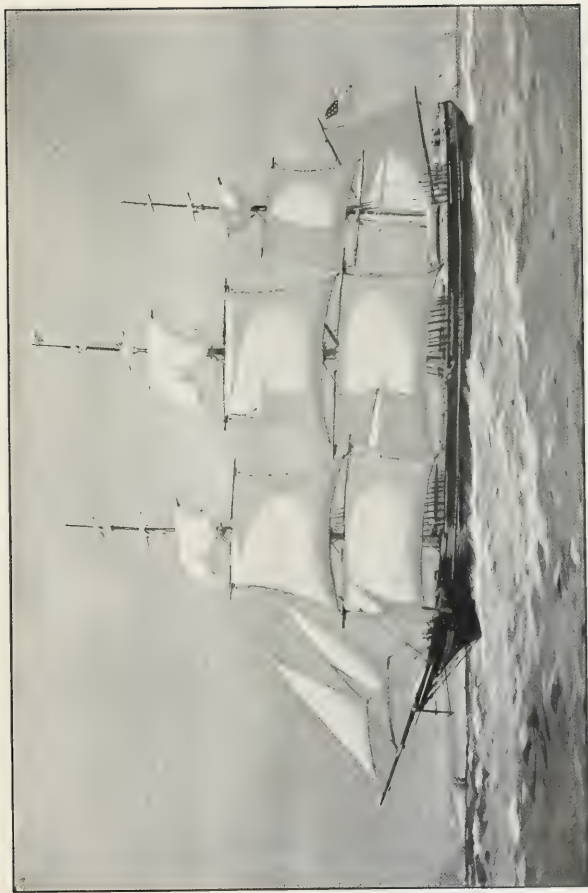
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American Clipper Ship Dashing Wave
Making Port in the Sixties

From Picture by W. Francis



Steam Tug Goes Washington-Estep

Another recruit is added to the list of Diesel-equipped boats on the Pacific Coast. The Ultican Towboat Co. of Aberdeen, Wash., is now converting the former Navy tug No. 49 from steam to Diesel power by the installation of a 6 cyl. 425 b.h.p. Washington-Estep Diesel Engine.

Both for main and auxiliary power, Washington-Estep Diesels are operating dependably in every type of boat from seiners to ferries. Complete accessibility of every part especially fits the Washington-Estep for installation in crowded quarters and saves time and money on repairs.



Navy Tug No. 49 Before Conversion.

WASHINGTON-ESTEP DIESEL ENGINES

offer

REMOVABLE CYLINDER LINERS

OPEN SIDE MAIN FRAME,
giving easy access to all bearings.

PISTONS ARE REMOVABLE
FROM BOTTOM OF CY-
LINDERS through large doors
in frame.

EXTRA LARGE CAGED VALVES.

DEEP RIGID ENGINE BASE,
eliminating danger of crank-
shaft breakage.

44-1800 BRAKE HORSE-
POWER.

"WASHINGTON-ESTEP" DIESEL ENGINES

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New Orleans, La.

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The National Magazine of Shipping



Official Organ
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President and Publisher

Bernard N. De Rochie,
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Official Organ
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of the Pacific

Alexander J. Dickie,
Editor

Paul Faulkner,
Advertising Manager

Ocean Shipping

HERBERT HOOVER, as Secretary of Commerce, issues his report for 1928, released November 30. This report shows considerable progress along many lines during the year and also shows a consolidation and stabilization of former gains. With regard to "Ocean Shipping," the report says:

A moderate recession took place in the activity of the ocean shipping of the United States and of the world as a whole during the fiscal year under review. This was to be expected in view of the abnormal demand for space which had prevailed in the previous year. In particular it was hardly to be anticipated that the tonnage of American overseas trade would equal that of 1926-1927, in view of the enormous exports of coal in that year to the United Kingdom, occasioned by the British miners' strike.

The merchant fleet under the American flag was substantially the same in size on June 30, 1928, as a year earlier. Taking into account seagoing steel and iron steam and motor vessels of 100 gross tons and over, our fleet aggregated 10,854,000 gross tons—6000 tons less than on June 30, 1927. During the same period the world's supply of shipping increased by nearly 2,000,000 tons, or 3 per cent.

The capacity of ships under construction in the United States declined from 144,000 gross tons at the close of the previous fiscal year to 45,000 tons on June 30, 1928. Construction under way throughout the world at large fell off during the same period from 2,823,000 gross tons to 2,639,000 tons, or by 6 per cent.

American vessels participated in the carriage of our water-borne foreign trade to the extent of 33½ per cent of the total value in the year ended June 30, 1928, as compared with 34 per cent in the preceding year.

Plymouth Hoe to Golden Gate

AMONG the group of British journalists who recently visited San Francisco was one R. A. J. Walling, Editor, Western Independent, Plymouth, England, who wrote a peculiarly fitting tribute to our Bay Region. Reprinted in part from the San Francisco Chronicle it reads as follows:

To me San Francisco is peculiarly homelike. It is an eager city. It is instinct with pep and progress. But

its modernity and prosperity are mellowed by the flowing aura of romance. It cherishes great memories. Its very names are music. It looks back on centuries of history.

But above all, San Francisco has its roots in the sea.

That indefinable something which sets an historic seaport apart from other towns is common to this splendid westernmost city of America and my somewhat smaller westernmost city of England. They are both gateways to great hinterlands. Both have their windows open to the ocean. Both receive into spacious harbors the ships and sailors of the seven seas. Both stand firm on an historic foundation of sea tradition. And they are definitely linked by the names and deeds of the seamen and adventurers of the sixteenth and seventeenth centuries.

We often say that if Francis Drake could wake from his three centuries sleep in Nombre Dios bay, he would be filled with marvel of the deeds of his heirs and successors in his town of Plymouth—with pride in some and shame in others. But I think if he could bring the Golden Hind through the Panama canal and up the coast to the Golden Gate, he would feel even greater wonderment and admiration for what in three centuries the American people have made of that harbor past which he sailed 350 years ago in his heroic but futile search for a passage round the north into the Atlantic.

I offer the fraternal greetings of the Atlantic gateway of England to the Pacific gateway of America.

Vale, Vestris!

We live and dream within a canopy of silken turbelows
And call it progress. Year by year
We span the empty winds and fix our eyes
Upon the stars, all heedless that our feet still know
The grosser elements of earth and sea,
Until disaster falls, and a taloned hand
Flings back the silken curtain we have wrought
Between ourselves and things that are.
Then all the strength of steel and steam
Must bow before the majesty that lives
Between the crests of waves. For seas are seas
And men are men. The heroes and those—other things,
Who trod the Vestris' reeling deck are counterparts
Of those who manned the Great Armada's sinking hopes
Three hundred years ago.

J. A. Q.

Naval Architects and Marine Engineers

Thirty-sixth General Meeting of the American Society Brings Out Many Interesting and Valuable Papers on Timely Subjects

ON November 15 and 16 at New York, The Society of Naval Architects and Marine Engineers held its thirty-sixth general meeting. Many very interesting papers were read and discussed and much valuable information was brought to light. It will be noted from the following list of the papers presented that the first day's session was largely devoted to design and construction problems affecting the naval architect and shipbuilder, and the second day to marine power plant problems affecting the marine engineer.

Thursday, November 15, 1928

The Scientific Application of Welding to Ship Construction, by James W. Owens.

Recent Developments in Shipbuilding on the Great Lakes, by Albert W. Cross.

Some Observations on the Design of Airplane Carriers and Notes on the Saratoga and Lexington, by Rear Admiral George H. Rock (CC), U.S.N.

Design of a Large Flying Boat, by Captain Holden C. Richardson (CC), U.S.N.

The Inclining Experiment, by Rear Admiral John G. Tawressey (CC), U.S.N., Retired.

Propeller Backing Power in Tugboats, by Alfred J. C. Robertson.

Friday, November 16, 1928

Development of Pulverized Fuel for Marine Purposes During 1927-1928, by Carl J. Jefferison, Commander Joseph S. Evans, U.S.N., and Commander Joseph Broshesk, U.S.N.

The Burning of Hydro-Carbons Under Marine Boilers, by Ernest H. Peabody.

Forced Blast Chain Grate Stoker Tests of a Marine Tube Boiler, by Thomas B. Stillman.

Turbine Electric Drive as Applied on the Great Lakes Cargo Ships, by C. R. Fisher and A. Kennedy, Jr.

The Central Power Station Goes to Sea, by Commander Quincy B. Newman, U.S.C.G.

Description and Trials of the California, by Captain Roger Williams.

Performance of the Converted Motor Vessels of the U.S. Shipping Board, by Captain Richard D. Gatewood (CC), U.S.N.

For the convenience of Pacific Marine Review readers, we are here abstracting very briefly the paper read on the first day, reserving those of the second day for the January issue.

Welding in Ship Construction, by James W. Owens. Mr. Owens is the head of the welding department of the Newport News Shipbuilding & Drydock Company, now employing 100 expert welders and having a daily electrode consumption of about 1000 pounds. He is a recognized authority on this subject and in his paper makes a very frank discussion of the whole problem of the "Scientific Application of Welding to Ship Construction." Owens lists three notable steps in the improvement of hull construction:

- First, Change from wood to iron and steel;
- Second, Introduction of pneumatic riveting;
- Third, Elimination of rivet by welding.

"We are now," says he, "on the threshold of this third step. Last year the Navy Department issued specifications for use of metal arc and gas welding on U.S. Navy

ships and American Bureau of Shipping revised its rules to permit construction of completely welded merchant ships. Homer L. Ferguson, in a recent address, predicted that in the not distant future rivets will be as scarce in ship construction as are horses on the streets today."

The paper gives a complete summary of the various methods of welding and their application in the shipyard. Comparative designs of riveted and of welded 13,000-ton deadweight capacity freighters, both complying with classification society rules, show the riveted hull 2944 tons weight and the welded hull 2450 tons, saving of 16.7 per cent. At 31 feet 8½ inches draft, welded ship deadweight capacity was 13,219 tons, riveted ship 12,719 tons, a gain of 500 tons or 3.9 per cent in capacity. This saving in weight and gain in capacity is obtained at a construction and material cost reduction of 3.7 per cent. Estimates show that in a shipyard doing an annual business of \$20,000,000 and producing only completely welded ships, it is possible to obtain an ultimate over-all saving of approximately 9 per cent, or \$1,800,000 annually.

The author lists the stock objections to welding and gives adequate answers to all of them. After discussing the fundamental principles of welded design and the fundamental principles of shop welding and cutting, he gives the current applications of welding in ship construction work in the United States Navy and at the Newport News Shipbuilding & Drydock Company, taking as examples the four vessels, U.S. Coast Guard cutter Northland, steamship California, steamship Virginia, and a large yacht for George F. Baker.

It is interesting to note that welding was used much more extensively on the Virginia than on her older sister, the California (60,000 pounds of electrode on the former, 30,000 pounds on the latter.) The paper is illustrated with many plates showing designs for welded joints for many parts of the ship's hull.

Recent Developments in Shipbuilding on the Great Lakes

by W. A. Cross.

This is a short historical summary of Great Lakes development and a description illustrated with complete general arrangement drawings of the bulk ore steamer Harry Coulby, 630 feet 9 inches long, 65 feet 10 inches beam, 33 feet deep, 14,000 short tons capacity at 20 feet draft; she can be loaded with iron ore in two to three hours and discharged by Hulett unloaders in from three to four hours. Accommodations for officers and crew are all above deck and hot and cold fresh water is available for all hands. Propulsion machinery is a triple steam engine, 3000 indicated horsepower at 95 revolutions a minute, Babcock & Wilcox water-tube boilers, natural draft, 215 pounds working pressure, 80 degrees superheat. This plant drives her at 13 statute miles an hour loaded, 14½ miles light.

Design of Airplane Carriers

by Rear Admiral George H. Rock, U.S.N.

At the present time only two airplane carriers, originally designed as such, exist in the navies of the world. These are British Hermes and Japanese Hasho. All others are converted ships and show a very wide di-

versity in many important characteristics. These differences are discussed with a view to future design. Some characteristics of the Lexington and Saratoga are compared with those of the carriers in other navies, and the trial data of the Saratoga and her standardization curves are displayed in considerable detail.

Design of a Large Flying Boat, by Captain H. C. Richardson, U.S.N.

A discussion of the considerations determining the form and dimensions of an all-metal construction, twin engine, triple float, patrol type monoplane now building for the U.S. Navy by the Consolidated Aircraft Corporation, Buffalo, New York. The calculations were based on Model Basin and Wind Tunnel data and cover performance under way until the plane takes the air.

The application of well tried methods of the naval architect in stress analysis as applied to this hydroplane after thorough model basin experiments makes this paper of great interest to naval architects. Complete details of design and construction are described and illustrated.

The Inclining Experiment, by Rear Admiral J. G. Tawresey, U.S.N.

There is much literature on this subject, much laying down of conditions (practical and ideal) that are necessary for its success. The author of this paper shows that these conditions are hardly ever met in the practical experiment and suggests several things that help

to obtain reliable results, notwithstanding unfavorable conditions. Most important is to reduce the time interval from first readings to last readings. The shorter the time the less change in such disturbing factors as wind, tidal currents, strain on mooring lines. If these remain approximately constant through the experiment they do not materially effect result. He suggests reduction in the number of readings and moves, the use of moderate angles of heel, the use of a reflecting pendulum to give a long reading length, the use of a quick method for moving inclining weights, and a properly organized crew, as means by which the shortening of time interval for experiment may be brought about. The use of the reflecting pendulum and the "check diagram" are heartily endorsed and these two adjuncts as used in the United States Navy are described and illustrated in detail.

Propeller Backing Power in Tugboats, by Alfred J. C. Robertson.

This paper presents the data obtained from model experiments on a special model of towboat hull built to show identical resistance towed in either direction and on a model of a 60 inch diameter 45 inch pitch propeller. These experiments were made for Fairbanks, Morse & Co. at the Washington Model Basin and prove "that it is quite impossible for a tugboat with a single screw to develop an efficiency going astern equal to that going ahead, a thing not infrequently specified."

Some Port Ideas

A Few Highlights from the Houston Meeting of the American Association of Port Authorities

THE convention of the American Association of Port Authorities, held at Houston, Texas, November 13 and 14, brought out many interesting papers on a great variety of subjects and produced some valuable reports from the technical committees.

Dr. Boris Stern of the United States Bureau of Statistics makes out a very sad case for the efficiency, or rather lack thereof, in American ports. Says he:

"Idle docks, idle equipment, and idle labor are not conducive to a healthy growth of the port; hence the spectacle of old and inadequate docks, the absence of modern dock facilities and of cargo handling equipment, and the questionable quality of longshore labor.

There is not a port in the United States which can boast of having at least one dock as thoroughly equipped for the purpose of handling general cargo as are some of the European ports. I have in mind the gantry and dock cranes which are used exclusively in handling ship's cargoes on the other side of the Atlantic. In this country, if we are to exclude the bulk cargoes, for the handling of which some of our ports are indeed very well equipped, and some of our industrial wharves, which are often well fitted for the handling of the individual commodity in connection with the industry concerned, all commodities are loaded and discharged with the ship's gear exclusively.

Not until an exhaustive study is made of cargo handling in some of the principal European ports along the lines now conducted by the United States Bureau of Labor Statistics shall we be in a position to compare the two processes and tell which is in the long run more effective and more economical for the handling of cargo.

However, I contend that the winches on most of the ships engaged in our foreign trade are so antiquated and in such shape that they often cancel all the advantages which might be effected either through improved dock facilities or through a more efficient handling of the cargo by the stevedores."

These conclusions and many others rapped the ears of port officials from all parts of the North American continent, as Dr. Stern described some of the conclusions he has reached after twenty months spent in a survey of labor productivity in the handling of cargo at the principal ports of the United States, a survey yet in progress. Study has been made in the ports of Seattle, Tacoma, Grays Harbor, Portland, San Francisco, Los Angeles, Cristobal, New Orleans, Mobile, Houston, Galveston, Port Arthur, Savannah, Charleston, Norfolk, Newport News, Baltimore, and Philadelphia, and remains yet to be completed at the ports of Boston and New York. But the great mass of statistics, including records over a period of not less than twelve months from every important stevedore company in the country, still awaits analysis, and the results of that analysis will eventually be published by the government.

In broaching the subject of his personal conclusions, Dr. Stern made it plain that he did not expect the port officials to agree with him so far as his remarks might be taken as applying to their individual ports. But his contention throughout his paper was that antiquated and uneconomical methods of cargo-handling prevail at United States ports. Modern wharves, he indicated, are very few and far between. "In riding along the waterfront of any port by land or water, one is amazed

at the large number of small, old, and dilapidated structures which pass as piers and which are still being used extensively for the purpose of loading and discharging ships. These wharves, built some forty or fifty years ago to accommodate the sailing vessels which plied the waters in those days, are now absolutely inadequate to handle the cargo of even a moderate sized steamer, not to speak of the giant vessels which now predominate in our foreign and intercoastal trade."

In contrasting what he described as the customary methods of hand-trucking with modern tractor-trailer methods, Dr. Stern gave an example where in the discharge of package cargo the dock gang was reduced from over 20 net men and truckers to only 4, all told, to handle cargo from ship to pile.

The paper severely criticized the practice of sending a ship to half a dozen ports for one cargo and that of shifting ships from pier to pier within a harbor. As to port competition, he said it is desirable if it results in creating new avenues of trade and in an increase of the total cargo handled, but "so far as it merely means the transfer of cargo from one port to another, unless other very large economies are effected thereby, the results are costly and uneconomical." It was described as not unusual for a ship to move with part cargo from New Orleans to Galveston, up the ship channel to Houston, then to Texas City, Port Arthur, Beaumont, and Lake Charles, before finally completing her load.

Stevedoring methods were declared wasteful, and burdensome because much more gear is kept available than is needed, and this has to be shifted from pier to pier, with such consequent expense of idle investment and other overhead that it would be folly for the stevedores to invest in up-to-date equipment.

"In peak seasons, and on sailing days, there may even be a temporary shortage of longshore labor in the port, but on the whole there exists in every port a larger supply of labor than is normally needed. Sooner or later the better element among the longshoremen abandons the waterfront for industries where they are assured of a steadier and more regular employment. This casual labor condition has been remedied at some of the West Coast ports by means of a central labor agency controlling the entire longshore labor in the port. This aims at a minimum rather than a maximum number of workers and guarantees to the individual longshoreman a minimum number of hours of work each week, enabling him to regard his work as a recognized trade.

In the course of the last few years, the Marine Service Bureau succeeded in reducing the number of workers from 4000 casually and regularly employed on the Los Angeles waterfront, to approximately 1300 regularly registered longshoremen who can be absolutely relied upon to be on the job. The average earnings of the longshoremen in the port of Los Angeles are larger and more equally distributed from month to month and from week to week than in any other port in the United States."

Report of Committee on Oil Pollution

The situation of the ports of North America with reference to oil pollution is far from ideal at the present time, and practically no measures, other than fines, have been provided for meeting the situation, according to the report of Colonel B. C. Allin, director of the port of Houston, as chairman of the American Association of Port Authorities committee on oil pollution.

Colonel Allin bases his report on replies to a questionnaire which was sent recently to various ports of the United States and Canada. These show that oil pollution in ports arises from tankers, from shipping in general, from shore plants, and from oil fields; that 88 per cent of the ports interrogated have punitive and preventive regulations, but practically no isolation or corrective measures exist. In 60 per cent of the ports no isolation devices are in effect; so that a vessel loading or discharging oil is not obliged to use precautions to prevent pollution in case of pipe breakage or other accident, and is not required to remove from the water such oil as she may have spilled.

Practically none of the ports possesses any preventive facilities which assist prevention of pollution by means of avoiding its possibility. In other words, with the exception of a few bulk oil loading stations, probably in the refineries, no report was made of tankage into which bilge water or ballast water from ship tanks might be pumped for separation. Only a quarter of the ports reported that they had any regulation requiring the pumping of bilge water into slop barges.

Colonel Allin pointed out that while Federal statutes and local regulations provided against pollution, ships continually pump out bilge water while in port, often at night to avoid detection, and recommended that facilities be provided at ports which would enable a vessel to pump into containers at a reasonable cost.

Canadian Port Legislation

Three acts of the Canada Parliament in 1928 made total loans of \$14,000,000 available for port developments at the three ports of Halifax, Quebec, and Saint John, according to the report of A. R. Tibbits, supervisor of harbor commissions for the Dominion Government, and Canadian representative of the committee on port legislation for the American Association of Port Authorities.

At Halifax, with the institution of the commission form of port government, the Halifax Harbor Commissioners have taken over the administration of \$12,000,000 of terminal facilities heretofore operated by Canadian National Railways, and the legislative act authorizes loans up to \$500,000 for improvement of those properties.

At Quebec loans up to \$8,500,000 are provided for in order that the harbor commissioners may continue the harbor development program for the next five years, including completion of the extensive Wolfe Cove Terminals. Total authorized loans to the Quebec Harbor Commissioners to date amount to \$22,000,000.

At Saint John the harbor commission created in 1927 has taken over the administration of all terminal facilities, including those which formerly were the property of the City of Saint John, and by an Act of 1928 the commissioners may issue loans up to a total of \$5,000,000, which are to be expended on additional berthing facilities and the erection of a 2,000,000-bushel elevator.



The California Tuna Fleet

Part II: How Tuna Boats Are Built

By O. H. Barnhill

IN the November installment of this article, a number of the larger boats of the tuna fleet were described and illustrated. Here follow some of the details of construction, equipment and financing characteristic of these large, modern fishing vessels.

The new steel boat *Orient* has seven inches of granular cork inside the shell and two 1-inch layers of wood. Only four inches of this insulation, however, is inside the frame, leaving extra wide cargo space, compared to a wood boat. In order to protect the fish hold from heat radiated by the metal hull, the latter is separated from the cork insulation by five inches of non-conducting air space. The bait wells are insulated with five inches of cork and lined with one inch of redwood.

More than 100,000 feet—four carloads—of Novoid corkboard has been used to insulate southern California fish boats and cannery storage rooms.

About 3000 feet of 1½-inch ammonia pipe is used on refrigerating a large tuna boat. This pipe has no screw connections, all joints being welded air-tight and all angles made by bending. Pipe is hung underneath the deck over the holds and against the bulkhead to protect the cargo from engine heat.

The modern tuna motorship is an evolution of the purse seiner. The size has gradually increased from 50 x 16 x 6 feet to 115 x 25 x 10 feet. The smaller boats used a 50-horsepower engine, while the larger ones are now propelled by diesels of 300 to 400 horsepower.

The hull of the typical tuna craft is not as flat as the United States Shipping Board recommends for work vessels, being shaped more like a sub chaser. Instead of the usual plan of placing the engine aft and cargo hold forward, this arrangement is reversed, in order to make room astern for the huge live bait box. The main cargo hold is located amidships, just aft of the cargo winch. The single mast nearby, with boom, is used entirely for handling supplies and cargo.

The stern is wide and low, affording plenty of room for hook-and-line fishing and lessening the hand lift of heavy specimens—



The *Hermosa*, a passenger and freight steamer recently converted into the largest tuna fishing boat of the southern California fleet.

sometimes three poles are needed to hoist a single large tuna. The rail around the stern is lowered to within a foot of the deck, further to lessen the labor of landing fish. Folding metal brackets sometimes are fastened outside the hull to afford additional standing room for fishermen. Some operators believe that cargo space aft has been sacrificed to bring the deck close to the water, therefore future vessels may ride higher astern.

The bow is comparatively blunt, giving large displacement to sustain the engine and other heavy machinery. The 300 horsepower Union in the Atlantic weighs 26 tons, while the 400-horsepower Fairbanks-Morse diesel and other machinery in Guy Silva's *Emma R. S.* weigh 40 tons.

The cabin is located on the spacious forward deck, formed by the hull's wide flare. Flat buttocks outboard and rather full buttocks inboard are formed by the aft lines, which give great sustaining power without in any way interfering with the flow of water to the propeller. The *Orient's* thin metal keel and rudder and trim hull lines lessen the water resistance and thus increase speed possibilities.

Increasingly comfortable quarters are being provided for the tuna craft's crew, which usually numbers 10 men, with berth space for two to five more. The cook's galley is equipped with aluminum utensils and a modern range using Protane

gas. The pilot house above is connected with the engine by rods, wires, and cables, enabling the steersman to operate both the wheel and power plant. Air valves minimize the strain on the reverse gear. Some of the newer boats are provided with air steering apparatus.

The unfortunate wrecking on the Mexican coast of a tuna boat, which pounded to pieces on the rocks in a few hours, resulted in heavier construction of the newer vessels. The open hold in the center of a tuna ship renders difficult construction staunch enough to stand all strains.

In building a schooner, sufficient keelsons are piled up to give the vessel a strong backbone. With the tuna boat this is impractical. Instead, the hull is made extra strong, some builders using a 6 x 6 shelf, to which is clamped a 4 x 12. It would be better to use 4-inch material entirely for the ceiling, but the usual practice is to substitute 2-inch, except on the floor.

Extra strong timbers are used to sustain the heavy diesel engine. Santos' and Sousa's fishing boat *Sacramento*, designed and built by Al Larson, has two 16 x 16 engine timbers 75 feet long. The keel and keelson are the same size, with 12 x 14 sister keelsons. The forms are made of two 4 x 8's bolted together and spaced 18 inches to centers. There are four 4 x 10 deck clamps on each side, bolted to the frame. The deck beams are 8 x 8 and 6 x 8. The garboard strake is 4 x 12, edge-

bolted to the keel with drift bolts. The hull is made of 4-inch plank-ing, sealed with 2 x 4's.

Douglas fir, called by the trade "Oregon pine," is used for the bulk of the construction, cut to order and air-cured. For planking the Campbell Machinery Company uses edge-grain material, which costs \$20 to \$40 per thousand feet more than clear lumber. Iron bark is used for the rudder and gunwale, redwood for the bait box. The cargo hold is divided by removable 2-inch planks into several bins or compartments. Part of these are filled with crushed ice, which is afterwards replaced with fish, if the space is needed.

It is conceded that if much larger tuna boat are built, steel should replace wood, because it is impracticable to use enough lumber to make a large wood vessel sufficiently rigid to prevent hogging and warping out of shape. Naval architects disagree as to where to draw the line between wood and steel boats. It is generally admitted, however, that 100 to 125 feet is the maximum length for a wood boat of this type. A steel vessel should be large enough to justify the use of hull plates amidships at least 3/8 inch thick, as these are strong enough not to bend or dent easily. The performance of the 112-foot Orient, first steel fish boat on the Pacific Coast, is being observed with keen interest.

Union, Winton, Atlas-Imperial, Washington-Estep, Fairbanks-Morse, Western-Enterprise, and Ingersoll-Rand are the principal makes of diesels used to propel tuna craft, which attain a speed of 10 to 11 knots an hour. One gallon of fuel oil costing 2 1/2 cents, moves a boat nearly a mile, average consumption being 12 to 15 gallons per hour. Fifteen gallons of lubricating oil per thousand miles is used, the cost being less than a cent a mile. Repair expense is negligible where the diesel is properly operated.

Most of the larger engines have six cylinders of 10- to 12-inch bore and 16-inch stroke. Twenty-four to 32 degree fuel is injected into the cylinders without previously mixing with air at 3000 to 4000 pounds per square inch pressure. Compression pressures run from 360 to 500 pounds. Starting air is generally used at 200 pounds. The propeller is turned rather slowly, about 275 revolutions per minute. Automatic force-feed lubrication prevents ex-

cessive bearing wear. Both 2- and 4-cycle type engines are used.

Fuel tanks of 5000 to 8000 gallons capacity, some of which have baffle plates every 18 inches, are located in the engine room. Some boats also have fuel tanks in the stern hold. It will thus be seen that the larger vessels carry enough fuel to make a round trip from New York to London.

Gas engines of 20 to 40 horsepower, or small diesels of similar capacity, are used to operate the auxiliary machinery, which includes bilge and bait pumps, electric generator, ice machine, winches, and air pumps. Two 6-inch centrifugal pumps circulate water through the bait tanks.

Guy Silva's new ship, Emma R S, completed last August, sets a new high-water mark in tuna boat equipment, having a radio outfit for both broadcasting and receiving, cabin furnished in gum wood, air steering, and much electrical machinery. In addition to an 18-kilowatt generator driven by the main engine, a 400-horsepower generator of the same size run by Fairbanks-Morse, there is another a small diesel of the same make.

All the auxiliaries are driven by electric motors, instead of being belted to the line shaft. The bilge pump and its motor are enclosed in a waterproof copper case. Two 6-inch centrifugal bait tank pumps are run by 5-horsepower motors and the general utility pump is operated by a 1 1/2-horsepower motor. Seventy-five pounds of compressed air is used for steering and 250 pounds for starting the engine.

A De Laval centrifuge purifies both fuel and lubricating oil. The former is heated to 180 degrees with electric coils near the centrifuge. A rod connects the two supply valves, closing one when the other is opened, which prevents mixing fuel and lubricating oils. This attachment was devised by Mr. Silva, who is a college trained engineer. A Brown electric pyrometer measures exhaust gas heat.

The Emma R S is 95 x 23 x 10 feet, cost \$60,000, and attains a speed of 12 knots on 15 gallons of 30-degree fuel oil per hour. There are six 2-berth state-rooms, Protane gas cooking range, pilot-house control, and other modern conveniences. There are two bait boxes, each 12 x 12 x 6 feet, and two large bait wells. The bait tanks hold 5 tons of live fry and 90 tons of water. The cargo holds have a capacity of 110 tons of iced fish. Re-

frigeration is furnished by a 5-ton Lipman compressor. There is 4 inches of cork insulation under deck and on bulkheads, 3 inches between frames. The ice bins hold 50 tons of crushed ice, the fuel tanks 7000 gallons of oil, and the lubricating oil tanks 200 gallons.

This fine vessel was designed by R. L. Prewitt, built by the San Diego Marine Construction Company, and sponsored by the Van Camp Sea Food Company. On her maiden voyage in September she went 400 miles down the coast and came back with 80 tons of bluefin tuna, worth \$125 per ton—a \$10,000 haul.

The largest and latest addition to the tuna fleet is the Hermosa, recently purchased from the Wrigley interests by Wm. Maggio, manager of the C. J. Hendry Company, San Francisco and San Pedro ship chandlers and dealers in marine hardware. For more than 20 years the Hermosa has carried tourists to Catalina Island.

The conversion of this well-built passenger steamer to a diesel fish-boat was accomplished by replacing the steam power plant with a 560-horsepower Fairbanks - Morse 3-cylinder diesel and erecting on the after deck two huge bait boxes holding 7 tons of live sardines and 120 tons of sea water. There is cargo space for 225 tons of iced fish and sleeping accommodations for 14 men.

The Hermosa is 150 feet in length, 26 feet beam, and 11 feet depth. A new steering wheel has been placed atop of the old pilot house, which occupies the forward end of the cabin. The galley is forward of the engine room, on the main deck, while the heavy duty diesel has been installed forward of the main cargo hold. The stern is not as wide and low as that of the newer tuna boats, but standing room for fishermen has been augmented by installing four large metal brackets outside the railing, two on either side. Forty horsepower is required to operate the auxiliary machinery, leaving 520 horsepower on the propeller shaft.

Most tuna boats are financed by fish packers, who receive the entire catch of vessels for which they furnish the necessary credit and cash. Owners of the larger craft usually have from \$10,000 to \$30,000 to invest. Part of this is paid on the engine and the balance on the hull. The down payment on a diesel is usually one-fourth to one-third of the total price. The balance is made

(Continued on Page 25, Blue Section)

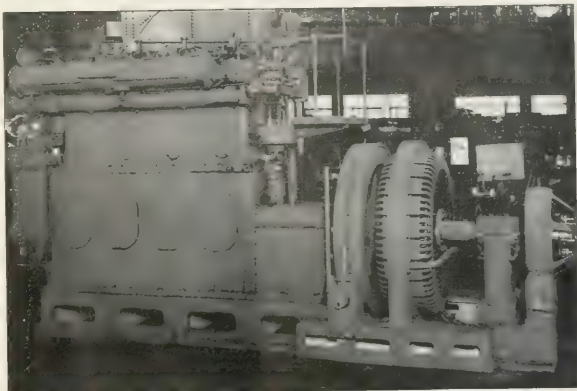
Diesel Aids Mississippi Control

Unusual Installation of Busch-Sulzer-General Electric Diesel Generator on Mattress Casting Barge for Mississippi River Commission

FROM the appropriation for flood control, Mississippi River, the Mississippi River Commission has purchased for the Fourth District at New Orleans a Busch-Sulzer 225-horsepower diesel engine with 3-phase, 60-cycle, 480-volt, alternating current General Electric generator and direct-connected exciter, all mounted on a common sub-base for installation on a new concrete mattress casting barge for river revetment work. This marks an economic advance in putting the efficient diesel engine to work on the National Flood Control problem.

During past floods bands of negroes wielding hand tools, filling sacks with earth for revetment purposes, everywhere gave evidence of the lack of modern methods and up-to-date machinery in keeping the Mississippi River in its bed during high water periods. In place of old time earth works, the use of concrete prepared on barges at the point where reinforcement of the river bank is needed, made in sections and tied together by steel cables, gives effective and permanent results.

The new barge is being rushed to completion, and the diesel-electric generating unit was purchased under contract providing penalty for delay in delivery. The successful bidder promised 50 days delivery, including electrical test of the complete unit at St. Louis; and ship-



Busch-Sulzer-General Electric 225-brake horsepower generating set for flood control barge.

ment was made 43 days after award of contract.

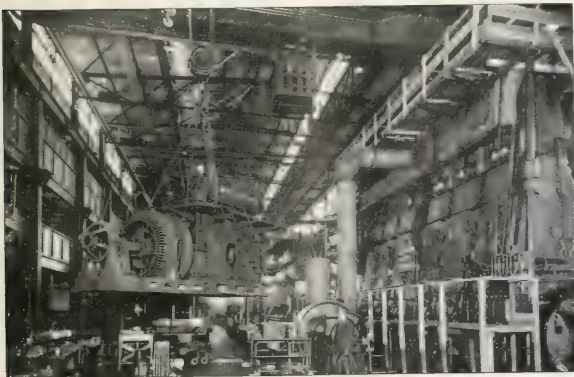
An interesting view of this 225-brake horsepower diesel-electric plant is shown in the illustration of the testing bay of the shops of the Busch-Sulzer Bros. Diesel Engine Co. The complete generating unit is swung from the crane which is transporting it from the test bed to the railroad car at the end of the shop.

On the right of the small unit may be seen two 3950 brake horsepower reversing marine engines on

order for the United States Shipping Board. These are 2-cycle, single-acting engines with six working cylinders, 30 inches bore by 52 inch stroke, with integral air compressor and separate motor driven turbo-blower supplying scavenging air. Turbo-blowers were supplied by the Elliott Company and one is seen in the foreground.

Test of the first of these large engines was started October 1. Fuel consumption of this large unit, after allowing for power required to drive the turbo-blower, is about 0.40 pound (running as low as 0.394 pound). For cargo ships with sea auxiliary requirements in the neighborhood of 100 horsepower, this low fuel consumption would correspond to total fuel consumption for all purposes per shaft horsepower of around 0.43 pound.

A rear view of the 225-brake horsepower generating unit is also shown which discloses a very neat appearance with minimum piping and gear. A substantial thrust bearing for this heavy duty marine service is fitted between the engine and flywheel. The bedplate and crankcase are cast as an integral housing. The holding down flanges are located at the lowest point on the engine, to facilitate mounting on sub-base. The cylinders are cast en bloc providing over-all rigidity.



View in the erecting bay of the St. Louis shops of the Busch-Sulzer Bros. Diesel Engine Company.

California Waterfront Safety Rules

The San Francisco Advisory Rules Committee, Representing Shipowners' Associations, Waterfront Employers' Union, Longshoremen's Associations, and the United States Employees' Compensation Commission, Publishes and Distributes Recommendations for Safety in Stevedoring Operations Aboard Ship

WITH the hearty approval of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast, the following rules, prepared by the San Francisco Advisory Rules Committee of the United States Employers' Compensation Commission, have been printed and distributed to all stevedoring companies by the Waterfront Employers Union.

As printed in pamphlet form, the rule numbers under each subhead are extended with blank space for suggestions; a blank space is left open under a subhead "Stevedoring Gear," on which subject "no rules have been developed to date;" and a blank leaf is provided under the subhead "Miscellaneous Company Rules." It is hoped that operation under these general advisory rules will bring out information and constructive critical comment that will greatly assist in the formation of a more definite and comprehensive code. The text of the rules now printed is as follows:

General Working Conditions

1. Whenever an accident occurs, the foreman in charge shall see that the injured party is given prompt and immediate attention. It shall be the duty of the injured man, if physically able, to report his injury to the foreman immediately.

2. Notices shall be exhibited in prominent positions at every dock, wharf, or quay, by each employer using the same, stating:

(a) The position of the first-aid kit and the name of the person in charge thereof.

(b) The telephone number of emergency hospital.

(c) Name, address, and telephone number of company's physician and hospital.

3. When a ship is lying at a dock, there shall be provided at all times

FOREWORD

The following recommended rules for prevention of accidents in stevedoring operations on shipboard are the result of thoughtful work of a committee composed of representatives of California waterfront employers and employees, including the Pacific American Steamship Association, the Shipowners' Association of the Pacific Coast, the Waterfront Employers' Union, the Marine Service Bureau of Los Angeles, the Longshoremen's Association of San Francisco, and the Accident Prevention Department of the California marine shipping associations, who have been meeting with me during the past year in the effort to reduce stevedoring accidents. It is believed that the more serious hazards demonstrated by the experience of the last few years are covered by these recommendations and that careful cooperation and compliance with them in stevedoring operations will materially reduce loss of life and limb.

More work is to be done before a complete set of rules capable of general application can be placed in final form. I hope that the present rules will be voluntarily placed in effect by all waterfront employers and employees in the 13th Compensation District, and that full cooperation be given in their beneficent purposes.

While the U.S. Employees' Compensation Commission heartily approves all measures tending towards the reduction of accidents coming within the scope of the U.S. Longshoremen's and Harbor Workers' Compensation Act, its accident prevention work has not yet reached the stage of approval of specific recommendations. The present rules derive their force from their preparation and adoption by local representatives of the industries affected.

WARREN H. PILLSBURY,
Deputy Commissioner,
U.S. Employees' Compensation
Commission.

a safe means of going to and from that ship.

4. Passage way on dock shall be kept clear from tackle end of ship's gear to shed, to give ample room for hooking or landing loads, except when working cars direct to or from ship.

5. Where men are to be required to work in a space below a deck where cargo is stowed, the said cargo in said deck must be so stowed as to have a clear space of three feet around hatch coaming of said deck for handling hatches.

6. Hold ladders must be kept clear, and no cargo stowed within six inches from inside rungs of ladder. If cargo is so stowed that it is not possible to use permanent hold ladders, portable ladders must be provided and properly secured.

7. Ship's ladders providing entrance to and exit from holds must

be kept in place and in a safe condition.

8. Ship's decks must be adequately lighted when necessary, or when working cargo at night. (A lighting standard shall be developed.)

9. One or more lights should be kept burning on the dock near the gangway or other entrance to the ship after dark while ship is tied up to dock.

Safe Practices

1. No cargo shall be worked through a section of a hatch unless the strongback of section adjacent to uncovered portion of hatch is bolted to hatch coamings, or otherwise secured or removed.

2. Strongbacks and hatch covers must be so stowed as not to interfere with a safe walkway for hatch tender from rail to hatch coaming, and so that drafts or gear cannot tip same into hatches or over ship's side.

3. No cargo to be hoisted from hatch until hatch covers and strongbacks are off and stowed clear of working gear, except such cargo as it is necessary to remove to clear beams so they can be removed.

4. After July 1, 1930, hatch covers must be on, or safety lines stretched around hatch coamings, unless cargo is being worked through the hatch.

5. Where an edge of cargo is exposed and there is danger of falls of persons, the edge should be guarded by a life line.

6. Men should not be sent aloft to work on booms or derricks unless such men are hoisted by hand power; otherwise booms must be lowered to deck for changing gear, or making necessary repairs.

7. No men shall be hoisted from dock to ship, or into hold, or vice versa, by ship's gear, except in the event of an accident.

8. No sling loads shall be held suspended over men's heads, either on wharf or ship.

9. No cargo shall be loaded or unloaded by a fall or sling at any intermediate deck unless either the hatch at that deck is securely covered, or a secure landing platform of a width not less than that of one

section of hatch coverings has been placed against the hatch.

10. Blocks, crow bars, chain slings, and other heavy equipment shall not be thrown from deck to ship's holds, or from deck to dock.

11. While working cargo which is likely to shift or roll on workmen, the cargo should be secured or blocked.

Ship's Gear

1. All bridles for removing strongbacks from hatch coamings shall be of sufficient length so that strongbacks can be hooked on without men climbing out on strongbacks to do so; shackles or toggles are recommended in place of hooks for handling strongbacks.

2. All boom guys and gin blocks shall be secured by shackles.

3. When deck-loads of lumber extend above the bulwarks, there should be a pennant of sufficient length to preclude the necessity of sending a workman down the ship's side to secure or release the boom guy from the deck ring bolt.

4. Adequate hand grips shall be provided on all hatch covers, having regard to their size and weight.

5. A rule for the proper coverings for hatches during non-working hours was proposed and ordered developed.

6. In addition to the tentative rules previously adopted, it was suggested that a standard be developed for ship construction, whereby there would be an equal spacing of strongbacks, and that the flange holding the hatch covers on the strongbacks and on coamings should be of ample width to prevent their slipping into the holds.

Hatch Tenders' Duties

The hatch tender should be an experienced rigger, and capable of handling the winches so that he can relieve the winch driver.

He is in charge of the deck operations of the gang, and in the absence of a foreman he is in charge of the entire gang.

Before the commencement of cargo hoisting, he should see that the side rails are unshipped and placed out of the way; that the saveall is made fast; that the booms are properly trimmed, and the boom guys properly secured. He should examine the topping lifts, to see that they are properly secured. Before unshipping strongbacks, and fore and afters, he should inspect, insofar as possible without going aloft, all gear used in connection with the working of his hatch—such as gin blocks, falls, guys, eye

splices, shackles, swivels, etc., and if in doubt as to the safe working condition of such gear, should consult the ship's deck officer in charge. All strongbacks, fore and afters, hatch covers, etc., should be stowed in an orderly manner, clear of the space over which cargo is to be hoisted, preferably on the off-shore side of the hatch.

When cargo is ready to be hoisted, he should give the winch driver the signals, if winch driver is unable to see load, and he should keep the load in sight at all times, constantly watching out for the safety of the men by warning them of any falling objects, and see that all loads or drafts are properly slung before being hoisted. He should watch out for the safe handling of cargo and the working of the running gear at all times. When knocking off work for the day he should see that the hatches are on and tarpaulin properly stretched across hatch covers and rope stretched across side rail and side rails properly shipped.

He should be constantly on the alert, watching all hoisting operations, and bear in mind that he is one of the most important members in the gang, and that a great deal of the safe handling of the cargo, both as to accidents to members of the gang and damage to the cargo, is in his hands, and that he is held more or less responsible for same.

Foremen's Duties

It is the General Foreman's duty to see that all gear is in good and safe working condition during the progress of loading or discharging.

The foreman-hatch tender or gang foreman should promptly call to the attention of the General Foreman any defect in gear, such

as slings, hooks, shackles, blocks, topping lifts, guys, falls, etc., which may appear or develop while working cargo, and if, in the judgment of the General Foreman, such defects be found to be possible causes of accidents, he should see that immediate repairs or replacements are made, even at the expense of a temporary stoppage of work, when necessary.

In the event that the foreman-hatch tender or gang foreman, upon discovery of defective gear, should find it impossible to get in touch immediately with the General Foreman, he should himself stop the work, if necessary, until the General Foreman shall have had the opportunity to pass upon the situation.

Duties of Employees

On or before January 1, 1929, every longshoreman in the service of a company engaged in stevedoring operations shall be furnished by his employer with a printed copy of instructions for his use and guidance in accident prevention. Said book of instructions shall include the requirement of the observance of all company safety rules, solicit co-operation of the workman in eliminating accidents due to unnecessary exposure to hazard, and such simple rules as may guide him in protecting himself and fellow workmen from industrial injuries.

Editorial Note

These rules are here printed mainly with the idea of exciting constructive critical comment. If any reader has suggestions for betterment or addition to the text or content of any rule or for additional rules, please send such suggestions promptly to Pacific Marine Review.

October 16, 1928.

After due consideration, the following rules for prevention of accidents in stevedoring operations aboard ship have been adopted by the Waterfront Employers' Union of San Francisco and the Marine Service Bureau of Los Angeles Harbor, and it is recommended that each member company, and also other stevedoring companies operating in the Ports of California, adopt the rules and enforce them, so far as is possible.

MARINE SERVICE BUREAU,
LOS ANGELES HARBOR.
E. A. MILLS, Chairman

WATERFRONT EMPLOYERS' UNION,
HUGH GALLAGHER,
President

These rules have been adopted by this Company, and strict observance of them is required of all executives, foremen, and bosses.

Effective:

, 192

Company

The form of pledge for the adoption of rules by stevedoring companies. This pledge is printed in the front of each book of rules.

Reardon Smith Line's New Service

British Motorship East Lynn Inaugurates New Service, Pacific Coast-United Kingdom

THE Reardon Smith Lines have inaugurated a new cargo service between the Pacific Coast and the United Kingdom. In October their motor vessel East Lynn was dispatched with full cargo, followed in November by the steamship King City—also fully loaded with Pacific Coast products.

The firm of T. A. Lee and Holway is Pacific Coast agent for the Reardon Smith Lines.

The East Lynn is a fine modern motorship, fresh from the yards of her builders, Wm. Doxford & Sons, Ltd. Incorporation of accommodations for passengers in limited numbers has been the feature of several recent designs for vessels in this trade; but in the case of the East Lynn no passengers are carried, and the designer has therefore been unhampered by their requirements. The result has been a pure type of cargo vessel, propelled by diesel engines, with every facility provided for the prompt and economical loading, carriage, and discharge of cargo.

The decision of Sir William Reardon Smith to establish this line is a sure indication of the rising importance of the Pacific Coast as a trade market. He has been a successful shipowner and operator for



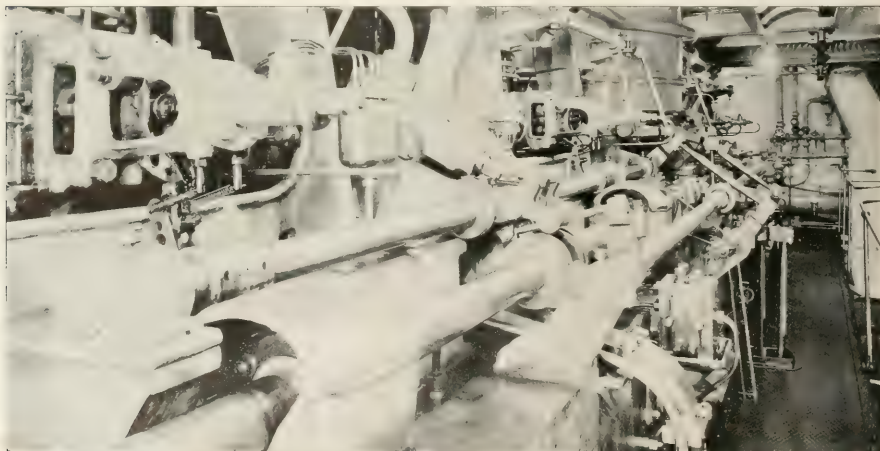
The Doxford engined, single-screw motorship East Lynn at a San Francisco pier.

a quarter of a century, and he has followed the sea for sixty years. His experience is reflected in the design of his vessels and his ideals in the character of their officers. He went to sea at an early age, following the career of his forebears, who fought with Nelson at the Nile. It was the British smack Unity out of Bideford, in 1868, that carried the youth on his first cruise. All of Sir Reardon's vessels are registered from Bideford. From that date until his first venture as a shipowner, his experience was

varied. It included an officer's berth in the American sailing vessel Vermont, out of Bath; rigging ships in Prince Edward Island; port captain and superintendent of construction for Hobarth & Sons.

The year 1883 found Captain William Reardon Smith afloat again, the youngest master in command of the largest vessel, sailing out of the Clyde. Seventeen years from cook's helper in the Unity to command of the full rigged ship Macrianish, says the record.

Some time ago Sir William Rear-

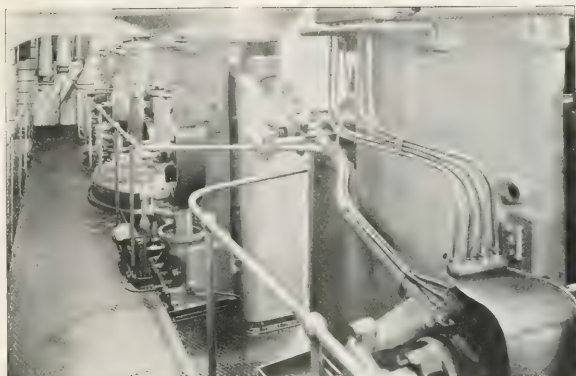


View of the operating platform of the engine room of the East Lynn, showing details of valve gear of Doxford engine.

don Smith established and financed a branch of the University of Wales at Cardiff, in which young men could be taught navigation, astronomy, seamanship, and kindred subjects. This gives the students an opportunity to obtain expert instruction in these lines without interfering with their other courses. Those to whom the sea appeals are therefore better fitted for rapid advancement afloat than others who are required to postpone this necessary instruction to later years.

Many of the officers of the Reardon Smith vessels are products of this school. The master of the East Lynn is Captain S. G. Mortimer. He is now thirty-four years of age and has been a master for six years. In thus selecting his men for his responsible positions afloat, the owner is able to get men imbued with his own ideals and to establish an esprit de corps. The system and service have both served to establish a strong bond of personal loyalty and admiration for the owner. Good ships and good men are found together under his house flag. As such, we welcome them to our harbors.

The East Lynn is a single-screw, diesel powered vessel of 400 feet length, 54 feet 3 inches beam, and 28 feet depth. Five cargo holds, each provided with 'tween decks, a



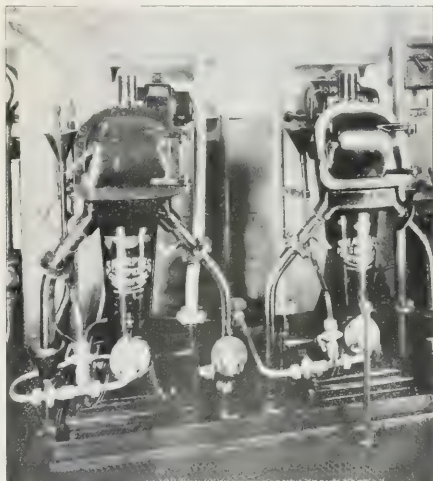
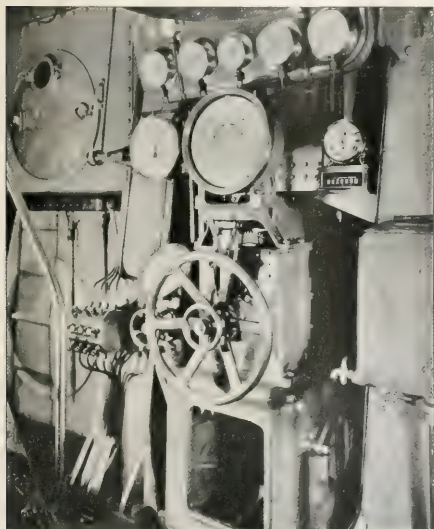
View on upper grating of engine room, showing cylinder heads and upper crosshead guides of Doxford diesel.

deep tank for bulk grain, poop and forecabin stowage, permit marked flexibility in space well adapted for general cargo. Her holds are roomy, and the absence of stanchions aids in rapidly loading and discharging.

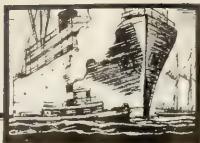
All cargo winches, the steering gear, and the anchor windlass are electrically operated. For supplying current for these and the electrically driven engine auxiliaries, three 100-brake horsepower diesel driven generating sets are installed.

On her trial trip, the East Lynn made 13.4 knots; on her maiden voyage, loaded, her speed was 12 knots on a daily consumption, for all purposes, of 7.5 tons of oil.

The main engines are of the 2-cycle Doxford, opposed piston, airless injection type. There are four working cylinders and a scavenging compressor on the main crank shaft. Two of the working cylinders are forward of the compressor and (Continued on page 31, Blue Form)



At left, control station, engine room of East Lynn. Above, Sharples supercentrifuges on the East Lynn.



Trade, Traffic, and Shipping

Steady Progress In World Trade

National Foreign Trade Council Issues Armistice Day Statement Showing the Condition, Volume, and Growth of the Exports of the Trading Nations of the World

TAKING the temperature of world trade on the tenth anniversary of the close of the Great War the National Foreign Trade Council finds that Europe has increased its foreign trade more rapidly than any other quarter of the world during the last two years and has now made up all but 10 per cent of the volume of export trade it carried on in 1913. Export growth throughout the world represents a resumption of progress at a little more than half the pre-war rate of increase.

War Cost

The latest figures for 82 nations conducting 95 per cent of the world's trade, show 1927 exports aggregating \$22,664,000,000 at the 1913 value of the dollar. This figure is about half of what the world's trade would have amounted to had its normal growth been uninterrupted by the war. Between 1900 and 1913 these nations made an annual average growth in exports of 6 1/2 per cent, which would have made their exports last year in normal circumstances a little more than \$44,000,000,000 at the 1913 dollar valuation. The accumulated sum by which the world's exports have during the past 14 years fallen short of this normal progress is estimated at about \$145,000,000,000 in 1913 dollars, or more than \$200,000,000,000 in our money. This staggering total, more than ten times the debt of the United States, is the cost to world trade of the economic dislocation that accompanied and followed the Great War.

Recovery Rapid

Two years ago the Council called attention on Armistice Day to the fact that in 1925 for the first time since the war international trade as measured in exports had surpassed its volume for 1913. The combined nations other than the United States had then made a small gain, which complete figures show to have been about four per cent, and the United States had made over 31 per cent advance.

The figures for 82 nations now disclose an even more satisfactory picture for 1927. They show a real growth of 11 per cent in exports over 1913 for the rest of the world and a maintenance of the growth of the United States to a 38 per cent corresponding surplus.

As was inevitable, the recovery of the European nations, now in full swing, has stimulated their exports at a more rapid rate than our own during the last two years. The 27 nations of Europe gained ten per cent in exports during this interval and have practically attained again the momentum of their prewar growth. The United States gained about five per cent between 1925 and 1927. The significant fact is, however, that the world as a whole, with a real export growth of 6 per

cent during the two years, has definitely embarked on a new growth in international trade at about half the rate of progress it made before the war.

Falling Prices

The period between 1925 and 1927 has been one of falling export prices, amounting in the aggregate for all countries and for all goods to about 6 per cent over the two years. The same values of trade thus represented a larger volume of goods and a larger volume of purchasing power. In the United States, for instance, a decreased apparent value in our exports of \$50,000,000 between 1925 and 1927 actually represented a gain in volume amount to over 10 per cent in maritime tonnage and a gain of over 5 per cent in the actual volume of all exports. Figures for the rest of this statement are therefore given in the standard value of the 1913 dollar.

Western Europe

The most notable trade advance in the past two years has been in Germany whose increase of \$317,000,000 represented a growth in export trade between 1925 and 1927 of 22 per cent. In 1925 Germany was doing only 58 per cent of her prewar export trade. She has now raised that proportion to 72 per cent and has passed France to become the world's third largest exporting nation. The rapidity of her progress now resumed toward attaining par in her prewar exports is a notable indication that her foreign trade still possesses great vitality. Within between two and three years at the most, at her present rate of export growth, Germany may be counted on to bring back this key factor of her prosperity to its prewar strength.

Due largely to the coal strike, England's foreign trade has decreased in actual values about \$124,000,000 since 1925. It is now within about 95 per cent of its 1913 volume, and it seems likely that this gap will be closed during the present year.

France, which in 1925 had increased its volume of trade to more than 8 per cent in excess of its 1913 exports, has gained \$86,000,000 in real trade during the past two years, and thus remains as the nation which has made the most substantial increase in Europe over its 1913 exports, an increase amounting to about \$201,000,000.

Spain gained about \$72,000,000 during the two years and is now doing 17 per cent more export trade than she did in 1913, a remarkable achievement over her 1925 status when she was 20 per cent under her 1913 export trade.

Italy increased her exports between 1925 and 1927 by about \$80,000,000 at 1913 values, a gain above 1913 of about 16 per cent.

Sweden acquired \$62,000,000 worth of new export trade during the two years and is now 39 per cent above her 1913 trade.

Belgium has increased its exports by about 10 per cent during the last two years and is now doing 73 per cent of its prewar trade, compared with 65 per cent which it has reached in 1925.

Holland increased its exports during the past two years by about \$54,000,000 and now conducts about 66 per cent of its prewar export trade compared with its 1925 proportion of 59 per cent.

Altogether the 27 nations of Europe gained \$988,000,000 worth of export trade in the two years. Before the war they did 62 per cent of the world's export trade. This was reduced to 44 per cent in 1925 and has returned to 48 per cent in 1927. The entire American continent gained but \$408,000,000 worth of trade in this interval, so the present recovery of Europe is notable by comparison.

Eastern Europe

In Eastern Europe the relative export gain has been the largest anywhere in the world. During the past two years the 14 nations that shipped only 62½ per cent of their prewar exports increased this proportion to 73 per cent last year, gaining \$314,000,000 worth of export trade and increasing the volume of their shipments by 23 per cent, or at almost twice the prewar momentum. The leading countries participating in this increase were Rumania and Russia, closely followed by Czechoslovakia, Poland, Austria, Finland, and Greece. Rumania increased her export trade in the two years by \$79,000,000 at 1913 values and reached an export total of \$165,000,000 in 1927, or actually 27 per cent in excess of her 1913 exports.

Russia's gain enabled her to reach an export total of \$247,000,000, increasing the proportion of her 1913 exports from 25 per cent in 1925 to 34 per cent in 1927. The present area of Russia is considerably less than that of the Russia of 1913, and it is estimated that in the equivalent of her industrial territory Russia is now exporting about 60 per cent of her 1913 shipments.

Among the other countries to make a substantial advance, the new states of Czechoslovakia and Poland increased their export trade by \$51,000,000 or 12 per cent

and \$33,000,000 or 20 per cent, respectively, during the two years.

Austria increased her exports by \$25,000,000 or about 14 per cent and Finland by \$19,000,000 or about 20 per cent.

Jugoslavia's export trade decreased during the two years by about 30 per cent. Her gain of \$44,000,000, however, since 1913 makes her 1927 total almost 200 per cent over her prewar export trade.

Greece, with an increase of \$36,000,000, has gained about 167 per cent over 1913 and made a 40 per cent increase in the last 2 years alone.

South America

Elsewhere in the world the only notable increase in the past two years has been in South America. Among the ten republics of that continent there has been during the past two years an aggregate increase in exports of about 13 per cent, making the total about 29 per cent in excess of 1913, a gain which compares favorably with the 38 per cent growth of the United States.

Argentina had the largest increase, with \$126,000,000, or about 22 per cent, giving the country an export valuation now of about 44 per cent in excess of its 1913 trade.

Colombia, Venezuela, Peru, and Chile had gains of \$34,000,000, \$21,000,000, \$16,000,000, and \$15,000,000 respectively, and proportionate increases of 60 per cent, 50 per cent, 20 per cent, and 10 per cent.

Brazil was the only large nation to lose in exports between 1925 and 1927, her trade falling away by \$18,000,000 or about 6 per cent. Brazil's 1927 exports were about 3 per cent less, at corresponding values, than those of 1913.

The largest total gain for 1927 over 1913 made by the exports of any country was that of the United States, of \$901,000,000, or 38 per cent. The next largest was that of Canada with \$364,000,000, or 79 per cent; and the third largest was that of Japan, with \$353,000,000, or 112 per cent.

Germany made the largest gain between 1925 and 1927 with \$321,000,000 or 23 per cent. The next largest was that of the United States with \$173,000,000 or 5 per cent, followed by Argentina with \$126,000,000, or 22 per cent, and seven European nations with gains exceeding \$60,000,000 apiece.

(Section Continued on Page 27, Blue Section)



Status of Shipbuilding Prices

Part II. Relating to Propulsion Plants

IN the first part of this article, published in the November issue of *Pacific Marine Review*, the National Council of American Shipbuilders set forth the present status of shipbuilding costs in regard to material and labor affecting the construction of hulls. The article now goes on to show how modern conditions affect the cost of marine propulsion machinery.

Propulsion Plants

A remarkable development has taken place. Steam pressures have been increased; direct drive turbines, geared turbines, diesel engines, turbine-electric, and diesel-electric drives have been developed and perfected. Boilers, auxiliaries, and energy-saving devices, such as economizers, feed water heaters, air preheaters, superheaters, and high vacuum apparatus have been applied and brought to a high state of development. The result has been greater fuel economy, higher speed, freedom from noise and vibration, greater safety and comfort, increased cargo space, greater ease in maneuvering, and superior cargo handling facilities.

Modern propelling machinery admittedly costs somewhat more than the older type of engine; but the extra cost in the majority of cases is fully justified by the economies and benefits gained. For example, take the following table which shows a comparison between certain items relating to high pressure geared turbine propelling plants and low pressure reciprocating engine installations. Four different size units have been selected, varying in output from 2000 to 9200 shaft horsepower, and a comparison between the corresponding weights, fuel consumptions, and costs installed on board ship have been made. The use of fuel oil under the boilers has been assumed in each case. The cost figures include the complete plant installed in the hull, and there have been added a normal shipyard overhead and 10 per cent for profit.

COMPARISON OF MARINE PROPELLING MACHINERY

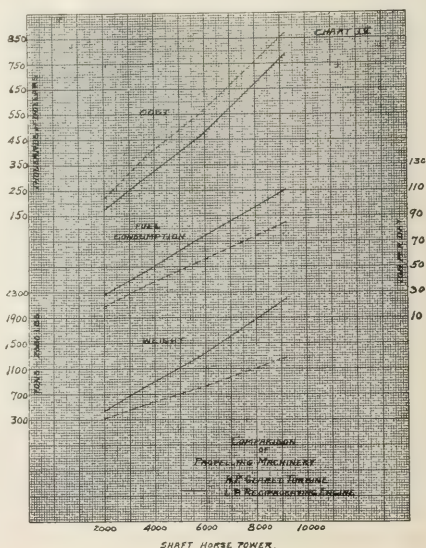
	High Pressure Geared Turbine Ships			
S.H.P. in service....	2,000	3,650	5,800	9,200
Number of shafts...	1	1	1	1
Boiler pressure	300	300	300	300
Superheat	200	200	200	200
Oil fuel per S.H.P. lbs.	0.90	0.89	0.875	0.86
Oil fuel, tons per day	19.26	34.76	54.30	84.66
Weight of Machinery:				
Wet tons	325	545	800	1,275
Dry tons	310	515	760	1,210
Cost installed	\$241,500	\$386,000	\$550,000	\$873,000

	Low Pressure Reciprocating Engine—Scotch Boilers			
I.H.P. in service	2,200	4,000	6,400	10,000
Number of shafts ..	1	1	1	2
Type engine	Triple	Quad.	Quad.	Quad
Boiler pressure.....	210	220	220	226
Oil fuel per I.H.P. lbs.	1.20	1.08	1.06	1.04
Oil fuel, tons per day	28.25	46.22	72.59	111.28

Weight of Machinery:

Wet tons	450	830	1,300	2,200
Dry tons	395	725	1,144	1,950
Cost installed	\$175,000	\$295,500	\$462,500	\$787,000

It will be noted that in this particular analysis a saving is shown as accruing to the modern propelling plant, in the matter of weight, of from 28 to 42 per cent. This means that the shipowner can carry from 125 to 925 tons more cargo or build a smaller ship to carry the same cargo. Again, there is in each case a saving of oil per day for the particular plants as rated in the table. On a percentage basis this means a reduced fuel consumption of from 31 to 24 per cent. To obtain these reduced fuel consumptions the cost of propelling machinery has increased from between \$88 and \$85 per shaft horsepower for the reciprocating engine and Scotch boiler installation to between \$121 and \$95 per shaft horsepower for the geared turbine or turbo-electric and water-tube boiler combination, a range of between 37 per cent and 12 per cent. As figures, these percentages are only comparative; but when translated into dollars the increased economic value of the modern ship proves itself. The price of fuel oil for the next three years can be taken at \$1.25 per barrel of 42 gallons at 7.9 pounds per gallon; 332 pounds for \$1.25 or \$0.0038 per pound. The 2200 indicated horsepower reciprocating engine with Scotch boilers would burn per hour 2640 pounds of oil costing \$10.04. The 2000 shaft horsepower turbine with water-tube boilers will burn per hour 1800 pounds of oil costing \$6.85, saving \$3.19 per hour on the fuel cost of reciprocating engine with



Scotch boilers. The turbine installation will cost \$66,500 more than the reciprocating engine; but, saving \$3.19 per hour, will pay for the increased cost in 20,085 hours or 870 days, after which the saving of \$3.19 per hour becomes a net reduction of \$76.60 per day in fuel cost. Similarly a 10,000 indicated horsepower reciprocating engine with scotch boilers would burn per hour 10,400 pounds of oil costing \$39.50 and the equivalent 9200 shaft horsepower turbine with water-tube boilers would burn per hour 7910 pounds of oil costing \$30, saving \$9.50 per hour on the fuel cost of the reciprocating engine with scotch boilers. The turbine installation will cost \$86,000 more than the reciprocating engine; but, saving \$9.50 per hour, will pay for the increased cost in 9050 hours or 377 days; after which the saving of \$9.50 per hour becomes a net reduction of \$228 a day in fuel cost. The power plant comparisons are shown graphically in the curves on Chart IV.

From the standpoint of fuel consumption the American ship of 1928 is worth more to the owner and operator than the corresponding ship of 1914.

Future Trends

But if selling prices for ships are as low as can be hoped for under present day conditions, what is the outlook for the future? It is to be expected that the price of a ship will, in normal times, increase approximately at the same rate as the cost of the labor and material entering into its construction, less such savings as may be made possible through the use of more modern tools and methods. The task of the shipbuilder is to a considerable extent one of assembling; so that, to a large degree, his selling price is determined for him by the price he has to pay for materials, equipment, and labor. Over these elements of cost the builder has little or no control. It is a case of supply and demand. If business should increase, some improvement can be made in the more efficient use of manpower and plant facilities, and with more work in the yards the overhead charges will have a wider spread. Maintenance of the highest efficiency in this industry is, as in many others, dependent upon volume of work, but volume has in recent years been lamentably lacking.

That there will be a reduction in the cost of ships built in the United States does not seem possible until such time as the shipowners give the yards sufficient business to put them upon a normal operating basis. When such a time shall come, the shipyards will further improve their efficiency and the overhead charges will be distributed over many instead of a few contracts. There will then be some hope for a fair profit to the builder, to be followed by lower prices to the shipowner.

The recent enactment of the Jones-White bill, and the passing of additional legislation favorable to shipping which it is hoped will follow, permits the shipowner to operate his vessels at a lower cost and thus encourages the purchase by him of new and always more efficient tonnage. At present the shipyards are looking to the shipowners for sufficient work to enable them to continue in business, to receive a fair and reasonable price for their product, and to eventually reduce the cost of ships. The present selling prices of new vessels are not out of line and when the facts are considered it becomes clear that any reduction in these prices must wait upon the action of the buyers themselves.

World-wide Radio Communication*

RADIO has built up a world-wide network of communication which, by the very nature of the medium through which it operates, must always remain free from delays and censorship, in war as well as peace. Nations no longer need be dependent upon the good will of their neighbors for uninterrupted communication with the outside world, as was necessary before the World War, when the cables, centering largely in London, were the only existing method for rapid and reliable overseas communication. Small as well as large nations have hastened to avail themselves of the security and freedom which radio affords. Typical of this spirit was the erection of one of the most complete transoceanic radio stations by the newly-formed Polish Government following the great war.

No haphazard development could possibly have produced this truly world-wide radio communication service. To American inventive and organizing genius must go the largest measure of praise for its present day efficiency and scope.

The development of transoceanic radio, from the time when the first radio signal limped weakly across the Atlantic, has now made obsolete the establishing of radio stations at isolated points remote from business and population centers. This practice has given way to a central operation system whereby distant transmitters are controlled from one center situated in the heart of commercial and financial America. Today we have realized this centralized operation in full. In the heart of New York's financial center is a radio central for communication with all the principal markets of the world. Here, invisible lanes of communication bear message traffic to and from more distant lands than are converged in any other single spot in the world. A similar radio central for transpacific service is located in San Francisco.

The radio centrals have a wide choice of available transmitters for handling traffic to any country with which a service has been arranged. The arrangements are sufficiently flexible so that additional facilities may be drawn upon for meeting any traffic emergency. To cite an instance, recently the aurora borealis, or the northern lights, that nature's freak which plays such havoc with all forms of communication, visited us. It came during the week-end, when there was an avalanche of radiograms to be transmitted. Our shortwave channels were temporarily deranged, but, thanks to the centralized operation system and the flexibility it permits, we turned to the Alexanderson alternators and cleared the message traffic without a hitch over the long wave channels.

In the insatiable search for continued improvement, the radio art evolved the facsimile system of transmitting actual words and pictures.

In the field of marine radio, where radio received its first practicability test, the advent of vacuum tube transmitters has ushered in a new order of efficiency. Besides permitting a greater range, the vacuum tube type of marine transmitter has made available additional channels in the air because of its sharper tuning; and it has paved the way for centralizing marine communication by doing away with the numerous short-range stations scattered along the coasts.

*Address of invitation by Arthur H. Mason, president of the committee of the Radio Corporation of America, to the distinguished representatives of the press and universities, and of the various international organizations, members and guests of the Foreign Correspondents' Club of New York, at the Hotel Astor, Wednesday, October 17.

The Longest Highway Bridge

Some Notes on the Use of Floating Equipment and Marine Transportation in the Construction of Vehicular Bridge over San Francisco Bay from San Mateo to Hayward

THE expert construction engineer is always eagerly on the lookout for major economies in the development of his projects. The proximity of deep salt water always stimulates his inventive genius to take advantage of its possibilities. An excellent example of this is now being demonstrated on San Francisco Bay, where salt water transport, flotation of working tools, and the use of marine equipment have combined to hasten construction and give a better finished result in the building of the toll bridge across San Francisco Bay from Covote Point in San Mateo County to a point on the east side of the bay opposite Hayward.

The bridge is said to be the longest highway bridge in the world. The bridge portion proper, without the approaches, has a length of 7.1 miles. Of this length, 1500 feet is to consist of five structural steel spans, each 300 feet long. The center span of these five is to be a lift span, which will allow a clearance of 125 feet above high water, with a clear opening of 270 feet in width. In their normal positions, the steel spans will have a clearance of 43 feet above low water at the center of the bridge, the bridge on each side rising on a $3\frac{1}{2}$ per cent grade from the causeways to the center span. The structural steel spans are to be supported by reinforced concrete piers which will be cast in place.

Each bay of the bridge is to be formed of precast reinforced concrete slabs supported on precast concrete piles. It is interesting to note that the economies of water transport are considered so essential by the Raymond Concrete Pile Company, the contractor building this bridge, that the company dredged a flotation channel five miles long, eight feet deep, and 165 feet wide, in which operation 1,400,000 cubic yards of material was removed.

Reinforcing steel for this bridge, supplied by the Bethlehem Steel Company, is unloaded from steamers on to lighters and spotted at the outfitting wharf of the old Alameda Plant of the Bethlehem Shipbuilding Corporation, which was leased by the Raymond Con-



The specially designed floating pile driver used by the Raymond Concrete Pile Company to set simultaneously the four piles which form each pier under the causeway portions of the bridge.

crete Pile Company for a casting yard. The big gantry crane at this plant takes the steel from the lighter and places it in the fabricating yard ready for use.

Piles for this bridge range from 16 inches square to 20 by 26 inches cross section, and from 45 to 145 feet in length. It was found by experiment that piles driven to a point where a penetration of one foot was obtained under 15 blows of a 5000-pound hammer would support 70 tons with a settlement of between $\frac{1}{4}$ and $\frac{1}{2}$ inch, and that when these piles were driven to the point where a penetration of one foot was obtained under 24 blows of the 5000-ton hammer they would support 100 tons without settlement. This last figure was adopted as a minimum requirement for driving the piles at the bridge. Maximum loading of the bridge does not exceed 40 tons to the pile, and in actual driving 75 per cent of the piles exceeded the requirement for 100 tons.

Each bent of the bridge consists of four piles which are driven to the requirements for penetration, cut off by hand to the grade of the bridge, and then capped in place. A special 4-lead pile driver was

designed and built by the Raymond Concrete Pile Company for this work. The leads on the driver are so arranged that they can be adjusted in any direction, and the two steam driven hammers can be moved from one lead to another as desired. Piles are lifted by the derrick from the barges with a 3-point suspension and are supported by a clamp bolted to the reinforcing bars so that they may be placed absolutely vertical.

As soon as the reinforced concrete cap for the bent is sufficiently hardened, the deck slabs are placed approximately in position, supported on wooden blocks, the slabs being spotted by the Havi-side floating derrick barge No. 4, which has a capacity of 100 tons and handles the 56-ton slabs easily. Hydraulic jacks are used to line up these slabs, making it possible for one man to spot accurately a 56-ton block without difficulty. When the slab is in position the load is taken off the wooden blocks by screw jacks which are left in position until all joints are concreted and the concrete is ready to take up the load. A lock is arranged between the slabs of the bridge deck by



Havivide Company's floating derrick No. 4 lifting concrete slab from barge. This derrick is completely equipped with wire rope manufactured by the American Steel and Wire Company.

forming a loop in the ends of several reinforcing bars in each slab. When the slabs are in place these loops are threaded by a heavy steel rod extending across the entire width of the bridge at each bent. This rod and its loops are then imbedded in the 10-inch concrete joint between the slabs.

During the month of July 7300 lineal feet of deck was placed on this bridge by the Havivide derrick barge without a single mishap. Since the beginning of the job this barge has placed 1500 feet of precast bridge deck per week without any delays or difficulties. In one particularly good day, 600 feet of slab were put in place. It is worthy of note in this connection that the Havivide derrick barge No. 4 is completely equipped with American wire rope.

All of the concrete slabs have now been placed and the piers to support the five 300-foot steel spans are practically complete. The structural steel was fabricated by the Virginia Bridge and Iron Company at Roanoke, Virginia, and is now being erected by that firm at South San Francisco. As these spans are completed at the erecting yard, they will be floated on barges, towed into place, and set in position directly from the barge.

The Foundation Company of New York is the sub-contractor for the construction of the deepwater piers. The Dutton Dredging Company built the fills for the approaches. Bethlehem Steel Corporation furnished the reinforcing steel. Pacific Portland Cement Company

furnished the cement. G. & N Gravel Co. supplied the sand and gravel.

Great credit for the efficiency and speed of the construction is due to R. A. McMenimen, work manager for the Raymond Concrete Pile Company; to W. X. Hull, yard superintendent; Thomas Branigan, pile driver superintendent; and R. F. Leftwich who was brought from New York as special concrete technician. Waddell & Hardesty of New York are consulting engineers.

This bridge and its approaches will form a concrete slab roadway 27 feet in width and 12 miles in

length. It will be lighted with 400 candlepower lights on metal standards 14 feet above the deck of the bridge and 33 feet above the roadway on the approaches, spaced at intervals of 210 feet on the bridge and 300 feet on the approaches. The total cost is included in a flat contract of \$5,000,000, for which the general contractors have undertaken to construct the bridge. The present progress indicates that the bridge will be opened well in advance of the specified time, which is June 1, 1929.

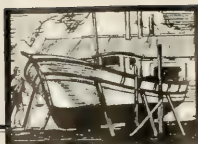
Interesting Port Annual

Tacoma Harbor Annual, 1928.

This annual book of the City of Tacoma is one of the most interesting and beautifully prepared that has come to our desk for some time. It contains over 100 pages and its contents would tend to open the eyes of the uninformed concerning the potentialities of this growing port on Puget Sound. The book contains a number of short essays on the variety of assets which this city enjoys—Tacoma, a World Port; "The Electric City"; City of Industries, her Water System; Water Power; Proximity to the wonders of Rainier National Park; and, of course, her Terminal Facilities and her ability to take care of the foreign trading vessels that seek the lumber and other products of her hinterland.



Havivide derrick No. 4 placing concrete floor slab on bridge. During the month of July, this American Steel and Wire Company equipped derrick placed 7300 lineal feet of deck slabs on this bridge. 1500-feet of this precast deck has been placed each week during the life of the job without a single mishap.



Workboats and Their Power Plants

Pacific Coast Diesel Cruiser Dolphin

A RECENT addition to the fleet of fine yachts flying the burgee of the California Yacht Club is the new Winton-diesel powered cruiser Dolphin, built by the Harbor Boat Building Co., San Pedro, for Frank W. Davey of Hollywood.

She is a product of the board of D. M. Callis, naval architect of the firm of Callis and Baier, of Los Angeles, and reflects great credit to the designer, who has achieved a fine example of the modern type of boat for Pacific Coast waters, ideally suited for Gulf of California and Alaskan cruising.

Sturdy and powerful, of molded frame construction, having a displacement of some 82 tons, yet lacking nothing in beauty of lines and yachty appearance, she has aroused the favorable comment of all who have seen her. More commodious accommodations than are usual for a vessel of this size have been attained through the use of a modern light weight diesel power plant, which



Bow view of cruiser Dolphin, showing her beamy comfortable design.

permitted placing the engine room at the after end of the hull. Just forward of the engine room, which is completely bulkheaded off from the living quarters, are two companionways leading from the deck to a passageway running fore and

aft below, from which open two double guest staterooms, one on each side of the vessel. Forward of these are two bathrooms finished in tile with tubs, shower heads, and running hot and cold water. Next forward is a large owner's stateroom, finished in old ivory and mahogany trim. The forecabin has accommodations for four men and is fitted with toilet and shower.

There are three deck structures. One forward containing the lounge, beautifully finished in mahogany and complete with radio, reading table, and comfortable furniture. Just aft of this and rising above it is the pilot house and captain's stateroom. The after house contains the galley, all modernly equipped, opening into the dining saloon, which is finished in mahogany, with beautiful built-in buffets.

The houses are all of teak, and the outside trim of hull and decks are also of teak with all mahogany work of finest grade of South American woods, hand-rubbed finish.

The general dimensions of the Dolphin are 81 feet long; 18 feet, 6 inches beam; 7 feet, 6 inches draft.

In keeping with her general high quality, she is powered with one of the new Winton lightweight, high speed, 200-horsepower diesel engines, direct-connected. This unit has driven the boat at a speed in excess of 12.5 knots, a quite remarkable performance for so beamy and heavy a boat as the Dolphin. The lack of vibration and the ability of the engine to operate on western fuel with a clear exhaust are exceptionally noteworthy and are sources of satisfaction to both the designer and the owner.

Her auxiliary equipment is most complete, consisting in part of two generating sets of total of 11.5 kilowatt capacity, electric water lifts, electric refrigeration, electric windlass and bilge pumps. She is also fitted with steam heating unit.



Broadside view of cruiser Dolphin, designed by D. M. Callis, Los Angeles naval architect, and built by the Harbor Boat Building Company, San Pedro, for the joint ownership of Frank W. Davey and his son, William M. Davey.

The New Winton Engine Company

ONE of the oldest builders of American diesel engines has recently been reorganized. We refer to the Winton Engine Company of Cleveland. Incorporation papers were formally filed August 11, 1928, under the laws of the State of Ohio, and the new company now owns all of the outstanding capital stock of the predecessor corporation of the same name. The principal reasons back of this plan are the desire of some of the former officers to retire from their active participation in the conduct of the company's affairs, and the necessity for augmenting the company's facilities in order to handle the increasing volume of



Alexander Winton, chairman of the Board of Directors of the new Winton Engine Company and founder of the original Winton Engine Company.

his credit, he occupies a foremost place in the list of those who contributed to the development of the high speed diesel-type engine in this country.

George W. Codrington, former vice-president, is president of the new corporation. He will be in direct charge of the many activities pertaining to the designing, building, and marketing of the company's products. Mr. Codrington's

elevation to the position of chief executive is the logical result of his successful conduct of the company's business in the past ten years, during which time Winton products have been brought to their present outstanding position in their respective fields. Joining the company some ten years ago in quite a minor capacity, Mr. Codrington has worked up to his present executive position through sheer merit. The entire diesel engine industry has watched Mr. Codrington's progress with interest, and the company is to be congratulated on having as its chief executive officer a man who so thoroughly knows his business.

Another man who likewise has earned his spurs and who now becomes vice-president of the company is Arthur G. Griesse. Mr. Griesse started with the company on his return from France immediately after the World War. Since that time he has actively represented the Winton Engine Company on the eastern seaboard. Knowledge of his activities in connection with the Winton Engine Company is widespread, and his friends in the business world are many. His knowledge of the trunk-piston diesel engine and its application to the marine field is second to none.

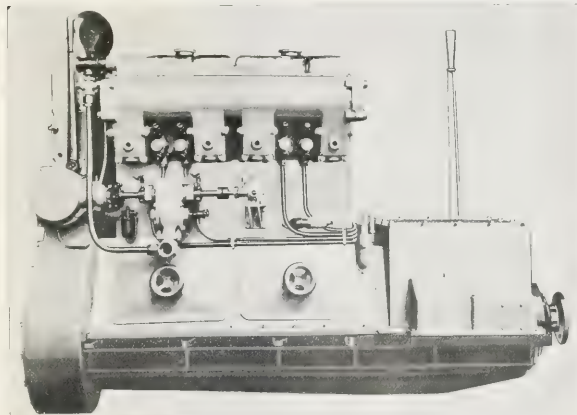
The directors of the new company will consist of Alexander Winton, George W. Codrington, A. G. Griesse, and the following na-



George W. Codrington, president of the new Winton Engine Company.

business. In carrying out this reorganization the company's ample resources have been further strengthened by financial affiliations of a highly important and beneficial character. The high standing of Winton products and the continued growth and progress of the company are assured by the fact that the same men who have brought the company its present large measure of success will continue to conduct its affairs.

Alexander Winton, founder of the company and for many years its president, now becomes chairman of the board of directors. Mr. Winton's career in the diesel industry is well known. As a pioneer, inventor, and mechanical engineer with many notable achievements to



Port side of Winton Model 4-144, 4-cylinder, 4-cycle, 7-inch bore, 8½-inch stroke, 60-H.P. at 450 R.P.M.; 100-H.P. at 750 R.P.M.; weight 4500 pounds.

tionally and internationally known financial men: Frank H. Shaw, vice-president of John Burnham & Company, Chicago; Ralph Hubbard of John Burnham & Company; I. F. Freiburger, vice-president of Cleveland Trust Company, Cleveland; Howard Whitehouse, Continental National Bank, Chicago; and Sheldon Noble of W. Noble Company of Detroit. The officers of the company, in addition to Messrs. Winton, Codrington, and Griese, consist of F. H. Shaw, vice-president; W. S. McKinstry, secretary and treasurer; and D. A. Lake, assistant treasurer.

The operating and sales person-

nel of the company remain unchanged. As in the past the company will continue to build marine and industrial engines, both diesel and gasoline types, and the officers and staff will adhere strictly to the policy of maintaining the high quality of Winton products. The resources and affairs of the company were never in better shape, and the entire organization will continue to be maintained on the same high level of efficiency that has characterized it since the company's inception. It is interesting to know that unfilled orders now in process as of September 15, 1928, total more than two million dollars.

keeping a force of men employed on general repairs of small craft. Miss Katherine Madden, manager, says that the past year has been very satisfactory in a business way, with prospects for some new construction in view. The two hulls recently built at this yard for Medina Brothers are proving fast and seaworthy vessels; so far nothing of their class has ever passed them at sea.

The Knappton Towing Company, of Astoria, Oregon, has ordered one of the larger **Washington-Estep** diesels which will be used in their workboat *Myrtle*, now a steam vessel. The new diesels are of six cylinders, 12 $\frac{1}{2}$ inches diameter by 16 inch stroke, and at 250-280 revolutions per minute will develop 325 brake horsepower.

Another **Washington-Estep** diesel, of 425 horsepower, has been ordered by the **Ultican Towboat Co.** of Aberdeen, Washington. This engine will be installed in the old naval tug No. 49, whose present steam plant is to be taken out and the new diesel installed. Cylinders on this job are 14 $\frac{1}{2}$ inches diameter and 18 inch stroke. The naval tug, No. 49, was purchased in Honolulu and towed to Aberdeen. The hull is in first class condition and with her new **Washington-Estep**, 425-horsepower diesel will be one of the best in the fleet.

Pacific Workboat Notes

The **United Ship Repair Company**, San Francisco, of which Dan Sutherland is manager, has acquired the property next to the shops of the **United Engineering Co.**, 272 Stuart street, and will at once erect thereon a modern mill and workshops for the rapid building of small craft up to 70 feet in length. As the new shop will have the advantage of close contact with the machine shops of the **United Engineering Co.**, the arrangement will be of advantage to prospective owners. At the present time the firm has three new boats in hand, two of the Bird class, and one of the Cub type. At this shop all classes of repairs, such as joiner work, hull repairs, and machinery, can be quickly handled.

W. F. Stone & Son on Oakland estuary, have a small yacht in hand, with quite a run of general repairs.

Wm. Cryer & Son, foot of Dennison Street, Oakland, are completing a new workboat for the fishing fleet of the **Hovden Company** of Monterey. This vessel, 73 feet length by 18 feet beam and 9 feet depth, is finished in the best possible manner. Her lines are also very fine for a craft of her type, and with her 135 horsepower, **Atlas-Imperial** diesel she will easily make 12 miles per hour. Ample fuel and water tankage has been provided so that long cruises can be made if necessary. A special purse seine turn-table is installed apt to permit easy handling of the big nets with a small number of hands.

Oakland is building several units for local and foreign workboats and yachts. Two sets of 90-horsepower each will be installed in a new yacht building at the Harbor Boat Works, San Pedro, also a Union diesel 6-cylinders, of 120-horsepower will be installed in the Coast Survey boat L-63, under construction there. A 5-cylinder, one hundred and twenty-five-horsepower diesel is being built for the new boat constructed by the **General Engineering and Drydock Co.** for A. Paladini, Inc.

Madden & Lewis, Sausalito, are

New Manager of Enterprise

JOHN F. Gilmore has lately been named manager of the **Enterprise Engine Company** of San Francisco.

Mr. Gilmore knows mechanical engineering and diesel engines. He was born in San Francisco and graduated from **Lick High School**.

After leaving school, he took employment with the **Pelton Water Wheel Co.**, remaining with that firm for six years. He then was made assistant to the late **William Donlon**, of the **Enterprise company**, which place he held for two years. The position of manager having been made vacant by Mr. Donlon's death, Mr. Gilmore was selected to fill it. His early training along mechanical lines, together with the valuable instruction of Mr. Donlon, makes the present incumbent particularly fitted for the position. Combined with his thorough knowledge of the business is a pleasant

personality and a wide circle of friends, both along the "front" and among those who operate shoreside factories.

The business of the **Enterprise Engine Company** is increasing steadily. The Company manufactures the well-known line of heavy duty gas engines, and acts as agent and service headquarters in San Francisco district for the **Western Enterprise Engine Co.** of Los Angeles, builders of diesel engines of all types. In addition to these activities, the firm of which Mr. Gilmore is executive head, builds for the **Enterprise Oil Burner Company** of San Francisco the newly developed burners for economically and properly handling fuel oil in furnaces, both ashore and afloat. These burners are built sturdily and simply, are said to be very economical.

Union Diesel Engine Company at

The Union Gas Engine Company

A Brief Record of Progress in Appreciation of a Good Name

THE name Union Gas Engine Company of Oakland, California, a name that for forty years has held a very secure niche in the internal combustion engine field, is now a part of the history of Pacific Coast progress. The firm is still carrying on at its Oakland plant under the name Union Diesel Engine Company and is building into Union Diesels the experience and the integrity that won for Union Heavy Duty Marine Gas Engines the confidence and respect of the maritime world. Old timers in Pacific Ocean trade lanes will, we are sure, feel with President O. H. Fischer of this company "some personal regret" at this necessary change of name. To them, as to us, it will seem fitting at this time to record some of the achievements which in the last forty-three years have made the name "Union Gas Engine" famous.

Established in 1885, this company built the world's first successful gasoline engine. In that year they were granted the patent covering the "make and break" system of electric spark ignition for gasoline engines. They invented the first successful vaporizer, or carburetor as it is now called. They invented the first marine reversing gear for gasoline engines. Column construction of cylinder support was originated in this plant, and the open crosshead construction for larger sizes. This latter radical difference in mechanical design gave the Union Gas Engine its marked superiority in the heavy duty class



The yacht Lucero, built at San Francisco for Charles L. Fair in 1895 and equipped with a 4-cylinder, 130-horsepower Union gas engine.

and made it possible for the company to build the world's largest gasoline engine — the 600 brake horsepower main unit on the Sacramento River railroad car ferry Ramon.

The first gasoline engine to meet the rigid endurance requirements of the United States Aeronautical Testing Laboratory was the Union Airplane Engine. This unit was adopted as standard equipment for nonrigid dirigibles of the United States Navy and Army Departments.

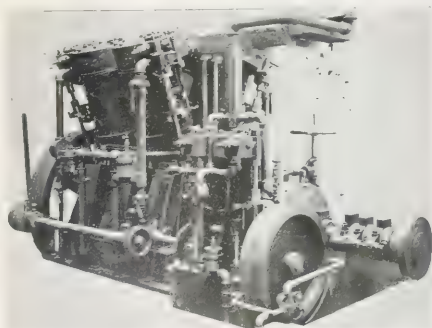
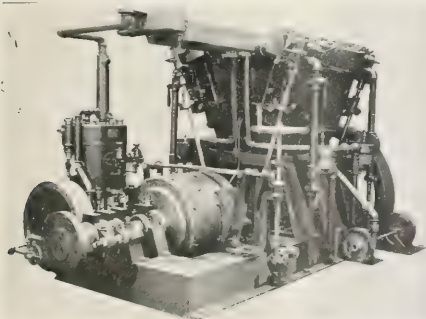
Among the early installations of the Union Gas Engine was a 7-horsepower unit on a San Francisco Bay freighter, Bonita, owned by Captain Anderson and operated between Alameda and San Francisco. Service with this boat started in 1886. Other early marine users in-

cluded Charlie McNeill, Henry Peterson, and Thomas Crowley.

Union Stationary Engines were much used as power plants for newspapers, in the irrigation projects all over the West, and in mining and industrial operations. Union engines were used for the first wireless sets built by the United States Navy and by the Federal Telegraph Company.

Our illustrations show a design of V-head gas engine brought out by the Union Gas Engine Company in the early nineties and antedating automotive practice by many years. The yacht Lucero, built for Charles L. Fair in 1895, was equipped with a 4-cylinder, 130-horsepower engine of this type.

The Union Diesel Engine Company will build diesels exclusively, (Continued on Page 25, Blue Section)



Starboard and port views of the 4-cylinder, 130-horsepower V-head, Union gasoline engine built by the Union Gas Engine Company for the yacht Lucero in 1895.



In the Engine Room

Mechanics for Marine Engineers

Part IV. A Safety Valve Problem

By A. L. Becker

THE safety valve problem, Fig. 3, illustrates the principles of statics in that it deals in moments and vertical forces. Assume the following details and conditions of the device:

Diameter of valve	3 inches
Area of valve	7.07 square inches
Boiler pressure	100 pounds gauge
Weight of valve and stem	7 pounds
Weight of lever	20 pounds
Length of lever	24 inches
Center of gravity of lever	12 inches from fulcrum

Question: To determine the weight necessary to place on the lever at a given distance from the fulcrum, the strain on the fulcrum and other useful features of the mechanism.

For convenience take moments about the fulcrum:

Moment of steam pressure is	$-707 \times 4 =$	-2828 in. lbs.
Moment of valve and stem is	$+ 7 \times 4 =$	$+ 28$ in. lbs.
Moment of lever	$+ 20 \times 12 =$	$+ 240$ in. lbs.
Total plus moments		$+ 268$ in. lbs.
Excess of negative moment		-2560 in. lbs.

To make sum of the moments about the fulcrum zero, the device must be equipped with a weight which will produce a plus moment of 2560 inch pounds. The following weights and corresponding distances from the fulcrum if multiplied together will produce the required moment and will solve the problem.

(1) 320 lbs. placed at 8" from the fulcrum	Product in each case is plus 2560 foot pound:
(2) 213 1/3 lbs. placed at 12" from the fulcrum	
(3) 160 lbs. placed at 16" from the fulcrum	
(4) 128 lbs. placed at 20" from the fulcrum	
(5) 106 2/3 lbs. placed at 24" from the fulcrum	

This sketch shows 128 pounds at 20 inches from the fulcrum. The plus forces acting on the lever are valve and stem 7 pounds, lever 20 pounds, weight 128 pounds. Total plus 155 pounds plus a required force

Mr. Becker is now coming to the point where he is applying, directly to the practical problems of the marine engineer, the common sense analysis developed in the first three installments of this series.

We are getting some favorable reaction to these articles. Any engineer who has a special problem would do well to send it in and get the benefit of Mr. Becker's practical experience.

at the fulcrum. The negative or upward forces acting on the lever is the steam pressure equal to 707 pounds. As the sum of the positive forces must equal the sum of the negative forces to produce equilibrium, the fulcrum must carry a positive force of 552 pounds, in order that the plus forces will be numerically equal to the negative forces, and their sum be zero.

The reaction of the fulcrum may likewise be obtained by taking moments about the center line of the valve.

Moment of weight—	$128 \times (20-4)$	2048 right hand
Moment of lever—	$20 \times (12-4)$	= 160 right hand
Total plus		+2208 right hand
Moment of force at fulcrum—	552×4	-2208 left hand

It will be observed that it is a simple matter using the data already acquired to assume a fixed weight (say 128 pounds) and determine the graduations on the lever corresponding to a range of steam pressures.

The reader will note that the preceding solutions have been elaborated and repeated apparently beyond the point of necessity and that the actual calculations employed are very brief and simple, as they employ only the processes of addition, subtraction, multiplication, and division coupled with the ability to think and analyze logically.

Pacific Coast Sea Temperatures

Sea water temperatures have been taken daily by the U. S. Coast and Geodetic Survey at a number of its tide stations. The following tabulation gives the maximum and minimum sea water temperatures in degrees Fahrenheit during the period of observation. This information should be of interest to marine engineers in connection with the efficiency of condensers, evaporators, and other auxiliaries.

Station	Maximum	Minimum	Period of Observations
San Diego, Calif.	72	51	Nov.'21 Dec.'25
La Jolla, Calif.	73	53	Jan.'25 July '28

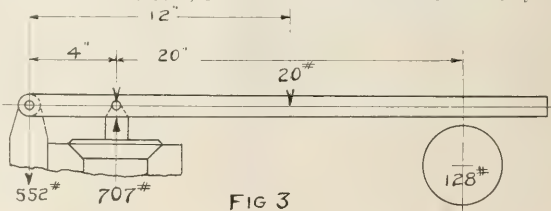


FIG 3

Los Angeles Harbor, Cal.	73	51	Dec.'23	June '28
San Francisco, Calif.	62	47	Nov.'21	Aug.'28
Astoria, Oregon	71	33	Jan.'25	Aug.'28
Seattle, Wash.	69	38	Dec.'21	Aug.'28
Anacortes, Wash.	59	40	Nov.'21	May '24
Ketchikan, Alaska	64	37	Nov.'21	Aug.'28
Sitka, Alaska	64	30	Oct.'24	Dec.'25
Seward, Alaska	63	32	May '25	Aug.'28

The following tabulation gives the average maximum and average minimum temperatures (in degrees Fahrenheit) for the three warmest and three coldest months of each year during the periods of observation covered by the above table.

Station	Average Maximum	Average Minimum
San Diego, Calif.	70	54
La Jolla, Calif.	72	56
Los Angeles, Calif.	70	55

San Francisco, Calif.	61	50
Astoria, Oregon	69	38
Seattle, Wash.	61	46
Anacortes, Wash.	58	42
Ketchikan, Alaska	61	40
Sitka, Alaska	60	33
Seward, Alaska	59	36

Some of the differences in temperatures at adjacent stations are probably due to a difference in the length of the series. The average maximum temperature at Seattle from six years of observations is 3 degrees greater than the average maximum temperature at Anacortes from two years of observations; but for the same two year period the average maximum temperature at Seattle was the same as at Anacortes. At San Francisco, where observations have been taken for several years, the water temperature appears to be several degrees lower than at other California stations.

A Short History of the Internal Combustion Engine

A Series of Illustrated Articles Showing Some High Spots in the Development which Led up to Our Present Forms of Gasoline and Oil Motors

SOME of our most useful inventions are the result of man's effort to create machines with which to destroy his enemies. All early conceptions of the prototypes of modern internal combustion engines seem to have been developed from applications of the explosive force of gunpowder to engines of destruction. Therefore the history of these prototypes may be said to date back to the earliest uses of gunpowder in Europe.

Roger Bacon, the English monk, who was one of the most brilliant men of his time, seems to have made the first gunpowder used in Europe, as it is recorded that he caused a gunpowder explosion during a riot at Oxford in February, 1278. The first cannon used in warfare was in 1346. These early applications of explosive forces brought about the suggestions of Hautefeuille, an eminent metallurgist and chemist, that the explosive force of gunpowder be employed to propel a piston in a cylinder. Hautefeuille's suggestion was made in 1668; but it is not recorded that he ever actually built an engine of this type, although Huggins and Papin are said to have attained some measure of success in applying this principle to small experimental engines in 1690. The meth-

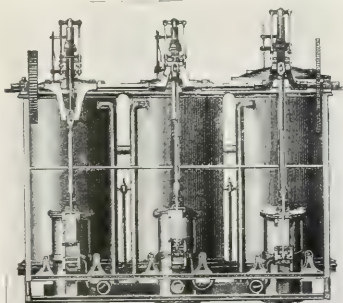


FIG. 1. Brown's Gasolene Engine, 1829

In this engine, gas was burned in the cylinder to expel the air and then a water jet was turned in to cause condensation. It was the first gas engine to have any commercial success. In May 1826 it was applied to an automotive vehicle, and worked. In 1827 one was put in a boat on the Thames.

od employed by Huggins and Papin was fairly practical as they attempted to use the explosion forces indirectly. A large cylindrical vessel filled with air was used for the explosion chamber, in which the burning of gunpowder expelled the air through check valves, thus leaving a partial vacuum after cooling. Atmospheric pressure then forced a piston to the bottom of the vessel, thereby doing useful work.

Papin is also credited with the invention of the first steam boiler with an internal fire box and having suggested the application of the principle of condensing to

steam engines, which plan was employed in Newcomer's atmospheric engine.

In 1794 Robert Street, an Englishman, patented the first gas engine. The bottom of the cylinder of this engine was heated by fire and a few drops of turpentine were introduced and evaporated by the heat as the piston was drawn up. Air which entered the cylinder mixed with the combustible vapor and the application of a gas flame through a port caused an explosion. Although this engine was very crude, the idea was a practical one.

The next development of importance was Lebon's engine, patented in France in 1799. A combustible mixture consisting of gas and air was compressed by pumps and discharged into a combustion chamber where detonation occurred. The hot gas under pressure was delivered to the working cylinder. Lebon's engine was of the double-acting type and, although his ideas were quite crude, the engine was the first to employ the constant pressure principle which is so prominent today in the theoretical diesel engine. The inventor's violent death in 1804 stopped further development of his ideas.

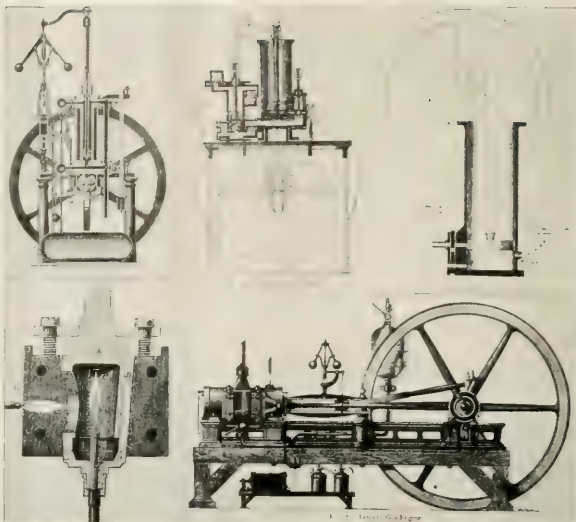
The Brown engine, patented in 1823 and 1826, was of a more practical design than its predecessors, although it was uneconomical and of inordinate proportions with regard to horsepower developed. Three vertical cylinders were em-

ployed and they were provided with removable cylinder heads containing the valves. Gas was admitted to the cylinders and burned to expel the air. A jet of water was then sprayed in the cylinder to cause condensation. Brown's engine was the first to attain any measure of commercial success, and at least two applications of this engine are of unusual interest. In 1826 a Brown engine with cylinder dimensions of 12 by 24 inches was applied to an automotive vehicle, the wheels of which were 5 feet in diameter, wheel base 75 inches, and the weight about 2000 pounds. In a test run conducted May 1826, the vehicle ascended a grade of 13½ inches in 12 feet. In 1827 a 36 foot boat equipped with a Brown engine made a speed of 7 to 8 miles an hour on the Thames River. In 1832 there were four water pumping engines in service.

A direct-acting gas explosion engine with one double-acting cylinder and having water jacketed cylinders and pistons was patented in 1833 by W. L. Wright. Ignition of the explosion mixture was accomplished by means of a small gas flame communicating with the cylinder through a small port or louch hole.

The Barnett engine, patented in 1838, marks one of the important milestones in the development of combustion engines. William Barnett was the first inventor to adopt the system of compressing the combustible mixture before igniting it, and he also invented an ignition cock that was widely used for over fifty years.

From 1838 to 1855 several patents were applied for in connection with combustion engines; but all of them used principles that had been previously used or suggested by earlier inventors. In 1855, however, the engine patented by A. V. Newton used a new system of ignition in the form of a hollow cast iron plug projecting into a combustion chamber that communicated with the working cylinder. A gas flame which was projected into the hollow of the plug maintained a red hot temperature of the metal, and as the piston uncovered a port between combustion chamber and working cylinder, combustion occurred. This system of firing combustible mixtures, now called surface ignition, was widely adopted in various modified forms and is used extensively to this day. Electric spark ignition was introduced by Barsanti and Mattoucci in their



Several curious forms of gas engine. The insert in the lower left corner shows the Newton system of ignition with a pilot flame.

engine patented in 1857. They also employed the free piston idea for the first time, but their engine, like its predecessors, was not destined to become a practical prime mover, although it was more economical of fuel than any engine preceding it.

The year 1860 marks the beginning of public use of combustion engines as it was in that year that Lenoir, a Frenchman, had his first engine built in Paris. This engine was designed along the general lines of existing steam engines, and, although no novel ideas were incorporated in it, the practical difficulties encountered by other in-

ventors were worked out to such an extent that 300 or 400 of Lenoir engines were in use as early as 1865; and several of them built in that year are said to be in operation today. Lenoir devoted a great deal of time to consideration of methods of slowing down the rate of the explosion of gases by means of stratification and injection of water, but some of his work along these lines indicates that he was not very familiar with the problems involved or with the work of other investigators who had already established certain laws of combustion that he ignored in his efforts to prove something to the contrary.

Marine Engineering Developments

Some of the More Recent Progress in the Design of Marine Propulsion Plants that Challenges the Attention of Operating Engineers

THE contest between steam and diesel power still goes merrily on.

In several of our recent issues we have called attention to the savings being effected in triple expansion steam plants by the installation of the Bauer-Wach or other systems of exhaust turbine using the exhaust from the low pressure cylinder and discharging directly to the condenser. These turbines

are connected to the engine shaft through flexible hydraulic coupling and double reduction gears.

About 100 installations have been made with increase in power ranging from 16 to 22 per cent on same fuel consumption.

Now we have to call attention to an application of exhaust turbines to diesel plants afloat which promises similar savings. This is known as the Buchi exhaust turbine sup-

recharging system and consists of an exhaust gas turbine driven blower which supplies air to the cylinders of the diesel engine at a pressure of 4 to 5 pounds per square inch, giving a complete scavenging effect and a greater weight of combustion air. During September this system was applied to the 3000 indicated horsepower Werkspoor diesel on the British motorship Raby Castle, owned by James Chambers & Company. The Raby Castle was completed in 1925 and has an excellent record of service. She has covered 160,000 miles at an average of 10.95 knots an hour on a daily consumption of 9.4 tons, her gross register tonnage being 4996. It was deemed advisable to give her more speed and the Buchi system was installed to that end. Her original trial speed at full power was 11.9 knots on a displacement of 5600 tons. After conversion to Buchi exhaust gas turbine supercharging, she made 13.334 knots on a displacement of 5900 tons, an improvement of approximately 12 per cent. The Buchi system is comparatively inexpensive to install requiring no structural changes in the ship.

The Highland Monarch, first of five sister motorships for the Nelson Line service between the United Kingdom, Brazil, and The Argentine via Spain and Portugal was recently delivered by Harland & Wolff from Belfast. Two Burmeister and Wain design 4-cycle, double-acting engines give a combined shaft horsepower of 8000 and drive the 17,900-ton displacement hull at

15 knots average sea speed. These vessels are for passenger and refrigerated freight service. An innovation is the direct diesel drive of the ammonia compressors of the refrigerating units. Two 4-cylinder, vis-a-vis arranged, horizontal oil engines are each connected through the crank shaft to two horizontal, double-acting ammonia compressors. The engine cylinders have a bore of 16½ inches and a stroke of 24 inches. The compressor cylinders have a bore of 11½ inches and a stroke of 15 inches. The working range of speeds is 90 to 125 revolutions a minute. Tests on the engine show 159 brake horsepower at 92.6 revolutions a minute, and 308 brake horsepower at 179 revolutions a minute. An overload test was made at 339 brake horsepower for an hour. Fuel consumption is less than 0.4 pound per brake horsepower hour. These two units, therefore, have a combined capacity load of about 650 brake horsepower. They are used exclusively for cargo refrigeration. For ships provisions, pantries, and galley a smaller electrically operated unit is provided.

Marine engineers should watch with great interest the performance of several new plants now or about to be put in operation. First, the three new freighters of the Reardon Smith Line, identical vessels except for power plant; one driven by opposed piston, solid injection diesel; one by 4-cycle, air-injection diesel; and the third by a very modern steam generating plant, coal burning, with triple expansion engine.

Second, the steamers especially designed to burn powered coal. One such is being built on the Atlantic Seaboard of the United States and one in England.

Third, the performance of the Beaver class liners of the Canadian Pacific, with their special arrangements of combinations of water-tube and Scotch boilers. High pressure and superheat on main turbines and ordinary pressures on auxiliaries.

Fifth, the improved turbo-electric liners, such as the California and Virginia, on the American inter-coastal service, and Viceroy of India on the British India service of the P. and O. This latter might be called in many ways the most modern passenger liner afloat.

The operating marine engineer needs to keep his mind alert and his eyes open these days, for improvements are coming thick and fast and any day he may be called on to supervise some operation on the glands of his old compound or triple that will make that old hooker take a new lease of life and perform like a thoroughbred colt.

LEXINGTON TRIALS

The U.S. Navy airplane carrier Lexington recently completed her final acceptance trials, developing 210,000 horsepower and 34½ knots an hour. Both figures are world records for large ships. Electric drive made good in the most powerful propulsion plant afloat. General Electric Co. and Bethlehem Shipbuilding Corp. are to be congratulated.



The recent disaster to the Lamport & Holt liner Vestris, with its tragic loss of life, has again directed the attention of naval architects to the unsinkable hull idea. The Malolo, pictured above, is said to approach this ideal as closely as any vessel afloat.



Auxiliaries-Ship Supplies-Marine Equipment

U. S. Rubber Shaft Sleeves

Protection of Outboard Propeller Shafts Insured by U. S. Rubber Service

U. S. rubber sleeves or shaft covering is, as its name implies, a rubber covering applied to shafts of ships between the composition bearing sleeves to give protection against corrosion, abrasion, and pitting. Ever since the advent of screw propellered ships, their shafts have been, and still are, fitted with composition metal sleeves where they are supported in the strut and stern tube bearings. This combination of steel and composition metal in intimate contact with sea water constitutes a galvanic battery, the resulting action or effect of which is an eating away or pitting of the steel shaft, which consequently is weakened and, unless means are taken to offset this, the shaft will eventually break.

It is also an acknowledged fact that in addition, on high speed ships, the shaft is subjected to abrasion. The waterproof and electrical insulating as well as abrasive resisting properties of rubber make it an ideal material for use in overcoming the above objectionable features to



U. S. Rubber used for reclaiming damaged shaft. Upper picture shows steel shaft with bronze liners cut away at a joint which had become defective, admitting sea water and badly pitting steel shaft, as shown.

Lower picture shows the gap between bronze liners thoroughly sealed with U. S. rubber shaft covering.

which ship shafts are subjected.

The U. S. rubber sleeves are installed at the shipyards or at the plant at which the shafts are made, the work being done by workmen specially trained for this kind of work. The rubber is applied in

sheet form in an unvulcanized condition, and the sleeve may consist of either two or three sheets of rubber approximately 1/8-inch thick, according to the condition under which the shafts are being used. After the various sheets of rubber constituting the sleeves have been applied to the shaft, they are vulcanized into a solid, homogeneous cover with a density and toughness equalling that of a tire tread. At each end of the rubber sleeve, where it is in contact with the ends of composition bearing sleeves, it has built in during process of construction perforated metal bands, which act as additional safeguards to the watertightness of the rubber sleeve at these points. The completed rubber sleeve has a very strong and positive adhesion to both the composition bearing sleeves and the steel shaft.

A shaft covered with rubber in the above noted manner is absolutely protected from all evils that a nonprotected steel shaft is subjected to in sea water.

U. S. rubber sleeves have proved so successful during the past five years that they are now a standard equipment on United States naval vessels, as well as vessels of the Lighthouse Department and Geodetic Survey, and are being specified on all new ships for the above departments as well as being in-



Tail shaft of steamer Andrea Luckenbach fitted with U. S. Rubber Sleeve. This sleeve is 17 feet 4 inches long, 13-5/8 inches inside diameter, and 3/8 inch thickness of wall. Both port and starboard shafts were so fitted.

stalled on shafts of the vessels now in use. Various naval architects throughout the country are specifying U.S. sleeves on both merchant ships and yachts.

Resiliency and elasticity of rubber make it absolutely impossible for the joint where the rubber sleeves are connected to the composition sleeves to open up, due to any torsion or bending of the shaft. This is a great weakness in the joints between composition sleeves. The life of the rubber sleeves should equal that of the shaft.

Such well-known yachts as the *Warrior*, the *Lydonia*, and the new yacht being built for George A. Baker at Newport News have U.S. sleeves as part of their equipment. The following steamers, *Leviathan*, *George Washington*, *American*, *Herman Frash*, *H. D. White*, *Harry Luckenbach*, *Walter A. Luckenbach*, *Dorothy Luckenbach*, *Mary Luckenbach*, *Andrea F. Luckenbach* and *Edward Luckenbach* are equipped with U.S. sleeves as well as a large number of vessels of the United States Navy, and several vessels of the Lighthouse Department.

At the last docking of the steamer *Leviathan* 1928, it was decided



Outboard tail shaft of a twin screw steamer fitted with rubber sleeves.

by the Board of Inspectors that two rubber sleeves installed on one of the *Leviathan's* shafts in October, 1923, be removed to permit an inspection of the shaft; and it was found that the shaft was in the same condition as at the time rubber covering was applied, and the United States Rubber Company received an order for the installing of sleeves to replace those removed.

The San Francisco office of the United States Rubber Company will be glad to confer with interested steamship owners on the prevention of shaft corrosion.

phreys, a well known Philadelphia shipbuilder, and the building of the famous vessel began at Boston in 1794. The greatest care was used in the selection of her timbers and equipment. She was launched with due ceremony in 1797, in time to assist in the brief struggle with France, searching West Indian waters for privateers. A few years later she took a prominent part in reducing the Barbary Coast pirates to submission. Then came her brilliant victories in the War of 1812, when she thrice successfully clashed with the British frigates *Guerriere*, *Zava*, and *Cyane*, one after another striking their colors to the Constitution. The stalwart vessel seemed to bear a charmed life, for not only was she victorious in three great naval battles, but three times she successfully eluded capture by overwhelming forces.

It was in her fight with the *Guerriere* that she got the name of "Old Ironsides." A shot struck her side and bounded back into the sea, whereupon a seaman shouted, "Huzza, her sides are made of iron."

Between 1828 and 1830 the Constitution was surveyed and reported unseaworthy, and it was decided to have her broken up. The old lion of the sea seemed at last to be doomed to an inglorious fate. But again her good luck saved her. Oliver Wendell Holmes, then a young law student, saw the announcement in the newspaper. Seizing a pen and a scrap of paper, he wrote the immortal verses entitled "Old Ironsides" recited by school children the country over ever since. The poem was published in the *Boston Advertiser*, promptly copied in newspapers all over the country, and circulated on handbills in the streets of Washington. The naval order to break her up was promptly revoked, and the Constitution went into dry-dock for repairs in 1833.

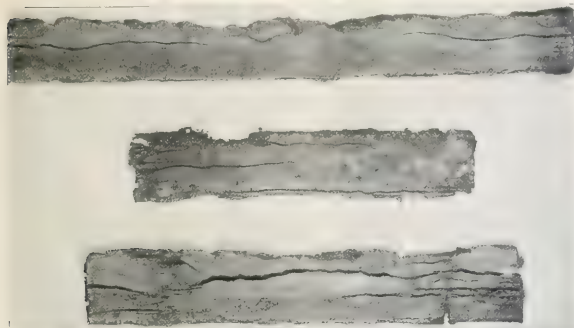
Stratford Oakum Service

Good Enough for Old Ironsides and Byrd's Antarctic Ships

PATRIOTIC citizens will be interested to know that the process of restoring the historic old frigate "Constitution" is duly progressing at the Boston Navy Yard under direction of Rear-Admiral Andrews. This doughty old sea warrior, whose decks were trodden by such gallant commanders as

Prebble, Hull, Bainbridge, Decatur, and Stewart, won important victories when they were sorely needed, inspiring confidence in the hearts of the people and giving the young republic a respectful standing in the eyes of the older nations.

The 44-gun frigate *Constitution* was designed by Joshua Hum-



Three slabs of Stratford Oakum taken from the seams of Old Ironsides after thirty-one years of continuous salt water service.

The same care used in building the Constitution seems to have been followed in repairing and reconditioning the old ship at various times in her later career, for apparently only the best material was good enough to put into "Old Ironsides," which had done much noble service to the country. An instance of this is shown in the oakum taken out with some of her timbers in the present process of restoration. This Stratford oakum was in the water at least 31 years, for the old ship was last previously docked in 1897.

The oakum with its fresh pine tar smell is still in excellent condition, in hard closely knit slabs of

water-tight fabric almost as solid as the timbers it bound together. The grain of the wood is clearly imprinted on these slabs. The effect of pressure and age was to weld it more closely to the wood and make it practically a part of the timber itself.

Stratford oakum, by the way, was put into Commander Byrd's ships—the City of New York and the Eleanor Bolling when they were being conditioned at the Tebo Yard of Todd Shipyards for their Antarctic expedition. Oakum gets a hard test in the rigors of a polar sea, and extra good caulking is necessary to insure sound and water-tight ships.

Byrd Selects Exide Batteries For Antarctic Trek

TWO and one-half tons of storage batteries are now on the way to the South Pole with the Byrd Antarctic Expedition.

All of these are Exides. With this equipment, Commander Byrd and his party will maintain radio communication with the world at large; also between the main base and the various subbases and exploration parties.

This is the largest equipment of storage batteries which has ever been taken from the beaten paths of civilization. But the experience of explorers like Byrd, MacMillan, and Amundsen has taught them that the storage battery adds that element of dependableness to the electrical equipment of the explorer which is so necessary when human lives may hang in the balance. Commander Byrd found his Exide batteries valuable pieces of equipment when he accompanied Donald MacMillan to the Arctic in 1925; also when he flew over the North Pole in 1926 and across the Atlantic in 1927.

According to Commander Byrd's plans, these Exide batteries will comprise part of the radio equipment on the airplanes and dog-sleds and of the various subbases.

The largest item of storage battery equipment is a 60-cell Exide for emergency radio service on the City of New York. This battery will furnish the power for the operation of the radio in the event of mishap to the generators. The ship Eleanor Bolling is similarly equipped. The airplanes will be equipped with type 1-TX-9-1 Exide aircraft batteries for radio service,

and the dog-sleds with 2-AC-11 batteries for radio receiving while on extended trips.

A large number of type LXL-9

Exide 6-volt radio batteries are included in the equipment to be used for radio and general purposes, both ashore and afloat. These Exide radio batteries will be distributed among the various subbases and portable radio sets. Several batteries of type 6-LXRE-13 and type 3-XC-13 will be used on snow tractors for engine starting and ignition. Still another set of Exides will be used for starting the engine in the electric power plant, which will furnish the light and power at the main base.

In assisting the engineers of the Byrd expedition to pick the correct types of batteries, the technical departments of The Electric Storage Battery Company, manufacturers of Exide batteries, were aided by the experience gained in equipping numerous other expeditions to various parts of the unexplored world. It is believed that this experience will be enriched by valuable battery data which will be furnished through the cooperation of the engineers of the Byrd expedition.

A New Rivet Buster

A NEW rivet buster, size 999, has been developed by the Ingersoll Rand Company, 11 Broadway, New York, for cutting or busting off rivet heads up to $\frac{3}{4}$ -inch and for knocking the rivets out. This pneumatic hammer is sufficiently light to be readily handled by one man, is easy to hold and fast cutting. In addition, the cutting tools are securely held in the hammer and the design is such that light weight tools are used, so that very little of the power of the hammer is absorbed by them.

The nozzle end is finished with a heavy square-section thread, over which a retainer nut screws. This nut takes the blow of the hammer through a rubber buffer if the hammer is operated without the cutting tool held against the work. The success of the retainer device is due to a heavy, strong knob on the upper end of the taper shank

tools used. This knob permits the use of light weight tools; it does not weaken the shank as notches or grooves cut in it would. It provides a shoulder for transmitting the blow through a split nozzle to the rubber buffer and on to the retainer nut, when the hammer is operated without the chisel held against the work, and it gives absolute safety. The chisel cannot be shot out of the tool.

Three different tools are furnished for use in the No. 999 rivet buster: No. 205 cutting chisel, a No. 204 shearing chisel, and a No. 206 knockout punch. The No. 205 cutting chisel has a cutting action rather than a shearing action and is recommended for general rivet busting and especially for loose rivets. The No. 204 shearing chisel is for use on tight rivets. The steel used in the chisels and punch is a special alloy steel.



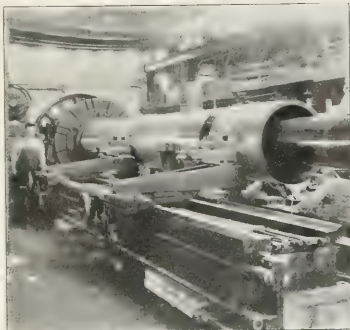
Ingersoll-Rand No. 999 pneumatic rivet buster.

Sandusky Seamless Shaft Sleeves

THE Paper and Textile of Sandusky, Ohio, Machinery Company has achieved very near perfection in the manufacture of cast seamless tubular shapes through the use of the fluid compression casting processes developed by W. H. Mills-paugh, the president of that firm. The company is the world's largest producer of large diameter nonferrous tubular castings in the special fields in which this product is used, and its foundry plant capacity is sufficient to meet the world's present consumption of such castings.

Tubular castings are made and machined at Sandusky in sizes from 3 inches to 46 inches diameter and in lengths up to 330 inches with wall thickness ranging from 1/8 inch up to 4 inches. Equipment and machinery are now being installed to handle much larger diameters. Steel, iron, nickel, brass, aluminum, copper, and bronze in great variety of specifications and alloy compositions are available in these sizes or can be cast to order. A modern, completely equipped testing laboratory checks all materials and every manufacturing process.

In the marine field, the Paper and Textile Machinery Company has furnished propeller shaft sleeves, stern tube bushings, rudder post sleeves, pump cylinder liners, periscope tubes, and other items for man-of the finest ships of the American merchant marine and of the United States Navy.



One of the giant turning and boring tools in the machine shop of the Paper and Textile Machinery Company.

The Mills-paugh fluid-compressed casting process first made possible the use of seamless cast bronze propeller shaft liners in one piece for any length of shaft. It will be readily seen that the freedom from

joints in Sandusky sleeves is a very important factor in propeller shaft economy. The brazed or welded joint in a liner is always a point of danger. The slightest fracture or imperfection admits sea water and immediately galvanic action is set up between the bronze liner and the steel shaft, causing serious corrosion, pitting, and eventual fracture. The Mills-paugh process of fluid compressed castings gives a dense seamless sleeve in any length required, entirely eliminating problems and expense of joints.

These fluid-compressed liners are furnished completely machined ready to shrink on the shaft in any type straight or stepped, tapered or counterbored, bell and spigot, or flanged at one end.

Cordes Brothers, San Francisco, are sales representatives in the marine field for the Paper and Textile Machinery Company. Bulletin No. 508, issued by this firm in July, 1928, gives complete information on Sandusky products.

An Ingenious Signal Device

A RECENTLY perfected lamp for warning signals has features of excellence which should make it admirable for marking channels and dangerous points where a more expensive outfit could not well be established.

This signaller is called the Wallace & Tiernan Dry Battery Flasher and, as its name implies, is operated by a few ordinary dry batteries. This feature permits the signal to be tipped and rocked about on a floating buoy. It is moisture

proof and salt air and spray do not affect it.

By an ingenious arrangement of lenses a very penetrating ray visible for two miles is projected or flashed all around the horizon every few seconds, the time element being variable at will. There is no clockwork or winding machinery whatever, the flashing being synchronized by a vibrating solenoid. As low voltage lamps will burn out, a very simple but ingenious arrangement has been worked into the unit by which a dozen small lamps are so placed that should one fail another one will automatically drop into circuit. It is claimed that under most exacting conditions between six and seven months constant service has been given. Naval authorities are now subjecting these flasher signals to severe tests with a view to their installation at points of advantage.

The distribution of these flashers for Central California is in the hands of Stephen Smith & Co., San Francisco, from whom all particulars can be obtained. This firm has a unit in operation at its office, an inspection of which will be of interest to marine men.



A large bronze sleeve being finished at Sandusky.

The Alfite Fire Extinguishing System

AS part of its complete engineering service for extinguishing fires, the American-La-France and Foamite Corporation offers a system of carbon dioxide protection against fire known as the Alfite System.

The Alfite System employs an inert gas known as Alfite gas confined in a liquid state in metal cylinders 51 inches in height and 8½ inches in diameter under a pressure of 900 to 1000 pounds. When the system is placed in operation a plunger ruptures a copper disc, used to seal the gas in the cylinder, and permits the gas to pass through piping to nozzles located at the fire. Here the gas is liberated into the room or space being protected where it expands and dilutes the air so as to smother the flame.

The system may be operated manually, semi-automatically, or automatically. A variety of operating devices are available.

The gas used in the Alfite System is a special grade of exceptional purity, virtually moisture free, and containing no sulphur dioxide or other impurity. It is colorless and odorless and has 1½ times the density of air.

Being a gas when freed, Alfite gas penetrates every place where air can reach. It works in three dimensions and is specially applicable for inaccessible places, sufficiently enclosed to permit the gas to be somewhat confined. Air diluted with 17 per cent of Alfite gas is sufficient to extinguish flames, but as a factor of safety the Alfite System is designed to provide 35 per cent dilution of the air in the space protected. Alfite gas is not toxic; it does not damage fabrics, machinery, and the like; it does not freeze; it does not deteriorate; and it is inexpensive.

The Alfite System is being applied to marine fire hazards. Cargo holds, machinery spaces, and other inaccessible places can be easily protected. By the use of a smoke detector, fires in cargo holds can be located and the system placed in operation automatically.

In the electrical field the Alfite System will be specially applicable, for water and most chemicals, except carbon tetrachloride, are more or less conductors of electricity. Furthermore, Alfite gas cannot harm costly electrical equipment, a most important factor. The Alfite

System does its work in seconds. Dilution of the air of 35 per cent can be obtained in one minute; and the fire is under control in 30 seconds. This system will not be

recommended for all fire risks. It does have its special applications, however, and can be used most efficiently under particular conditions.

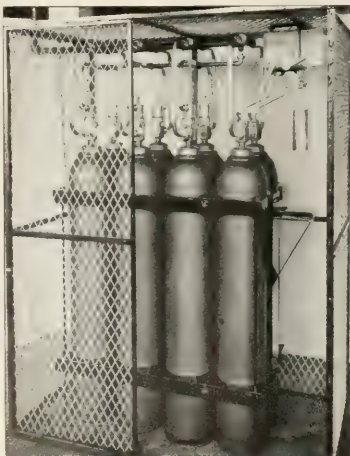
Ten Per Cent Savings Guaranteed

OVER fifty thousand Ray rotary oil burners have been installed by the W. S. Ray Manufacturing Company of San Francisco and are in satisfactory use. These installations cover a very wide variety of applications, domestic, industrial, and marine heating plants, cooking ranges afloat and ashore, steam generating plants for all types of industrial use, and marine steam propulsion plants.

Ray marine oil burners are installed on a guarantee of 10 per cent savings in total fuel consumption. When the W. S. Ray Manufacturing Company announced this policy some of the wise old timers shook their heads rather sadly and decided another good business had gone wrong. Today it is widely acknowledged that the Ray burner has made good on its guarantee.

On the following named vessels, a list that covers many types of service, it is claimed that the installation of Ray burners has resulted in an average fuel saving of 18 per cent.

S.S. Stanley Dollar
S.S. Katherine Luckenbach
S.S. Admiral Dewey
S.S. City of Sacramento
S.S. Corona
S.S. Trimountain
S.S. J. D. Peters
S.S. Taganak
S.S. Crescent City
S.S. Eagle
S.S. Modoc
S.S. J. C. Fitzsimmons
S.S. Mei Ping
S.S. Sinaloa
S.S. Camayagua
U.S.A. transport Grant
U.S.S. Navigator
U.S.S. Tillamook
U.S.S. Glacier
U.S.S. Algoma
U.S.S. Pinola
U.S.A. Engineers dredge Houston
Dredge Sacramento
Dredge Dillingham
Dredge Tampa
Dredge Jefferson
Dredge Miami
Dredge Iota
Dredge San Joaquin



Group of Alfite cylinders in a marine installation.

Calif. Board of Harbor
Comm. clam shell
dredge
Ferry Woodward Ladner
Yacht Pathfinder
Yacht Vergena
Yacht Machigonne
Yacht Doris
Tug J.W.P.
Tug Osprey No. 7
Barge Birmingham.
The W. S. Ray Manufacturing Company maintains an expert engineering organization thoroughly versed in the theory and practice of oil combustion. This organization is at the service of the maritime interests of the Pacific Coast to solve their oil-burning problems.

Usually the Ray engineers can guarantee a very substantial saving in fuel economy, a saving to more than justify the installation of Ray burners.

A Convenient Crane Lift-Tractor

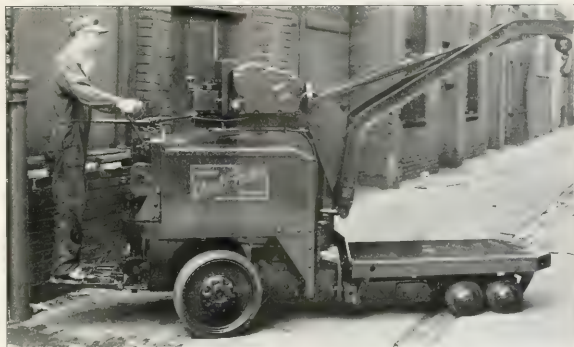
THE initial loading crane lift-tractor is now finding its place in plants where the well-known system of skid loading has been adopted.

It is quite essential to first load heavy boxes, castings, or assembled units taken from railway cars or street trucks on to skids which are picked up by tractors with elevating platforms. These parts so loaded are then ready for all subsequent rehandling by other electric lift tractors.

The electric crane hoist receives its power from the same battery that drives the tractor and operates the platform lift motor. Three motors are used, all are Elwell-Parker of the fully enclosed type.

The machine is essentially a one-man tool that enables the operator to lift 1500 pound loads onto skids and later pick up a skid load of 6000 pounds for transport at 3 to 5 miles per hour. Crane loads may be picked up over end of platform or at 90 degrees to either side.

The crane proper swivels on ball and roller bearings while the boom may be raised or lowered by power. The enclosed horizontal drive motor is located beneath battery compartment just forward of operator, all control levers are within easy reach. Drive motor delivers power through a complete chain of drop forged parts except phosphor bronze worm wheel to the 22-inch $4\frac{1}{2}$ -inch rubber tired drive



Elwell-Parker crane lift-tractor. Crane capacity 1500 pounds; skid load capacity 6000 pounds.

wheel. The trail axle is fitted with two or four 10x5-inch rubber tired wheels as service conditions dictate.

Steering connections to the four or six wheels are of the ball and socket type and are set high in the frame to afford ample clearance for rough runway or incline crest operations. The center of gravity is particularly low resulting from the heavy underframe construction and the placing of propelling and lift mechanism within the frame members.

All Elwell-Parker safety features are incorporated in this machine.

tery to stand up to it.

A typical installation of this starting plug is that on the Bolinder engine used for auxiliary motive power on the pilot boat Gracie S. of the San Francisco Bar Pilots. To serve this starting system on this boat there has recently been installed a Willard 12-volt G-E. L-R-31 battery, guaranteed to hold up a 30 ampere discharge for three hours. The time required for heating the coil is seldom over 30 seconds and current is never on over five minutes; so that there is ample reserve available. This battery was supplied by Julius Brunton & Sons, marine distributors in San Francisco for the Willard Battery. Willard units and Willard service are available also at Seattle, Portland, Los Angeles, and all the more important American ports.

Reports from the Gracie S. and from the engineers of other vessels are to the effect that the starting plug for semi-diesel engines as manufactured and marketed by the Thompson Machine Works has met with a great deal of favor from marine and industrial users in the San Francisco bay district. Both of the young men associated in the design of this plug are good electricians and practical marine engineers. In addition to their manufacturing activities, they handle machinery and engineering repairs afloat and ashore and are well equipped for prompt and satisfactory service.

Willard Storage Battery Performance

STORAGE batteries have many uses afloat. One of the more recent applications is to the electrical starting of the so-called hot bulb or semi-diesel type of heavy oil engine. These engines have certain advantages which are largely comprised in lower first cost as compared with the full diesel type. For starting, the bulb in the head cylinder is usually heated by a special gasoline torch. This has a decided disadvantage afloat in the fire risk involved, and many attempts have been made to provide a satisfactory electrical starter for such engines.

Messrs. A. Benedetti and Frank Gassagne of the Thompson Ma-

chine Works of San Francisco have evolved a system which is working very nicely on several local installations. In this system a plug, with an electrical connection like that of the ordinary spark plug, projects inside the head of the cylinder a specially designed resistance coil of alloy selected for its ability to stand up under high temperatures. This coil is designed to work on a 12-volt battery and becomes incandescent in a very few seconds after current is turned through it. The coil takes 30 amperes on the wire at 12 volts, the current diminishing slightly as the coil heats up. This is a high rate of discharge and requires an exceptional 12-volt bat-

The Herzog Electrical Company

UNDER the guidance of the late Melville W. Herzog, the San Francisco firm bearing his name developed many original and ingenious applications of electrical power to marine auxiliary machinery. Mr. Herzog possessed a pioneering impulse which often led him into new and untried mechanical paths. His friends used sometimes to ask, "Why rush in 'where angels would fear to tread'?" To this his usual reply was "If you don't row upstream you will drift back with the current."

One of his adventures with electrical auxiliaries was a complete electrical steering gear with electrical telemotor and indicator. This was brought out first in connection with the building of motorships on the Pacific Coast, being first applied on the McCormick motorship S. I. Allard and later on the concrete ship Faith. When the Faith was sold to European buyers some years ago, her machinery, including the Herzog steering gear was transferred to a steel ship and the steering gear is still functioning perfectly.

In 1918 when this gear was installed many marine experts were as skeptical of its success as they were of the utility of the concrete hull in which it was placed. Some, however, recognizing the ingenuity of Mr. Herzog, dubbed his gear as "the brains of the ship." The concrete ship was a commercial failure. As the late Captain Alex Woodside put it, a steel hull of the same dimensions would take 1300 tons more cargo. But today the electrical steering mechanism is all the vogue



The late Melville W. Herzog.

in marine engineering circles.

Melville W. Herzog built into all his marine and industrial electrical work the sterling qualities of his personal integrity and originality. Today the Herzog Electrical Company is carrying on the policy of its founder under the able direction of his widow, Katherine G. Herzog, who has built up a capable organization to serve the industrial and maritime interests of San Francisco harbor.

While busily engaged in the routine work of its general electrical contract business, the Herzog Electrical Company is carrying on some important experimental developments and from time to time will have interesting announcements to make.

for valve operating service in industries where regulation of pressures and temperatures of gases and fluids is necessary, it is likewise adaptable to many miscellaneous applications, such as operating skylights, awnings, radiators, and garage doors.

Literature describing this new unit (called C-H type Ao Valve Operating Unit) will be sent free upon request to The Cutler-Hammer Mfg. Co.

Trade Literature

Sterling Viking II. The Sterling Engine Company, Buffalo, New York, has issued a very artistically prepared booklet on the subject of the Sterling Viking II. These gas engines have found a very practical application in yachts, cruisers, fireboats, and other types of craft where there exists the necessity for heavy duty combined with conservation in weight, space, and fuel storage.

The Sterling Viking engine is built in six and eight cylinders, with 8 and 9 inch bore. The present booklet describes the engine thoroughly in a brief and clear style.

Internal Combustion Engines is another new catalog put out by the Sterling Engine Co., this book covering commercial type gas engines for prime movers for pumps, air compressors, generators, bridges, fans, etc.

These two interesting booklets will be sent free on application to the Buffalo office of the company or to King-Knight Company, San Francisco.

Electric Heat in General Electric Factories is the title of a booklet issued by General Electric Company, Schenectady, N.Y. The book gives a fine exposition of "electric operation of ovens, furnaces, and other types of heating equipment."

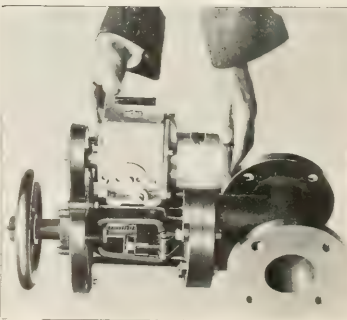
Silent Gears is a booklet describing and graphically illustrating the many uses of fabroil and textolite silent gears, which should interest a number of our readers.

Both books will be sent free on application to any of the offices of the General Electric Company.

New Motor Hand For Operating Valves

A NEW motor-driven valve operating unit has just been announced by The Cutler-Hammer Mfg. Co., Milwaukee, which makes possible automatic operation of all valves up to 6 inches. Although so small that it can be held in one hand, this unique operating unit has a rating of 15 pound feet. It can be operated automatically by means of float switches, temperature controlling devices, and pressure regulators, or by conveniently located push buttons.

Although only recently placed on the market this valve operating unit is similar in principle to the standard C-H Dean operating unit which has a successful record of 12 years. While designed primarily



The Cutler-Hammer motor hand.



Marine Insurance

Edited by JAMES A. QUINBY

Uncle Sam a Hull Underwriter? Shall Federal Government Enter Marine Insurance Business?

WHEN the Jones-White Bill was passed last year, a strenuous effort was made by certain eastern shipowning interests to include a measure allowing the Shipping Board to administer a fund for hull insurance covering the entire value of new vessels to be built under the provisions of the

act. Proponents of this government underwriting scheme asserted that American hull underwriters were guilty of discriminatory practices and cited instances of great variation in moral hazard relied upon by insurers in fixing premiums, where such variation was unsupported by loss records. They further asserted that the American market, as at present constituted, did not offer a sufficient "spread" to cover the additional vessels, and if government underwriting facilities were not available, the business would naturally go to foreign competitors. Finally, in a burst of enthusiastic economic patriotism, it was proclaimed that a large proportion of hull insurance influenced by low rates would go to foreign markets anyway, even if American companies had adequate facilities, so why not keep good American dollars at home by putting the government in the insurance business?

Insurance Provisions of Jones-White Bill a Compromise

In order to satisfy the clamor of these shipping interests, a provision was inserted into the Jones-White Bill allowing the Shipping Board to administer the hull coverage on the government's own interest in the new vessels. In order to determine the advisability of inserting any insurance provision in the Act, hearings were held at which both the insurers and the shipowning interests were represented.

These hearings were held not before Congress as a whole, but before the Merchant Marine and Fisheries Committee, whose duty it is to pass upon and recommend proposed legislation within its jurisdiction. It is reported that the attitude of this committee was somewhat unfavorable to the representatives of the American insurance companies who appeared before it. Members of the committee have gone so far as to say that they anticipate further efforts to enlarge upon the insurance measures of the Jones-White Bill at the next session of Congress.

We believe that the injection of the United States

—AMBITION—

OUR eastern underwriters are elite and erudite
As on Manhattan's thoroughfares they rally forth, bedight
With boutonnières and swagger sticks and lavender cravats
And nonchalance and savoir faire, and hats yes, derby hats.

I do not look with jaundiced eye on striped pants or spats,
But fancy-free, my memory recalls those Eastern hats—
Had I the necessary nerve—my fry would be complete—
—The nerve to sport an iron lid on California Street.

J. A. Q.

government into the marine insurance business would be as disastrous, both for the business and for the taxpayers, as were the memorable efforts of the country in connection with the merchant marine and with the railroads during the war. Government ownership, even in a modified phase, may be ex-

cellent in theory, but, like a Platonic friendship with a blonde, it is apt to be disastrous in practice. Proponents of the measure will answer that it is in no sense government operation but more nearly resembles a funding of insurance facilities, similar to the banking facilities of the Federal Reserve Bank, which has proved eminently successful. The difficulty with this theory is that the operation of the Federal Reserve Bank is in effect a strengthening of the credit of individual banks, which are independently operated, while the insurance of hulls by the Shipping Board would be a direct competition with individual insurance concerns.

There is undoubtedly some basis for the shipowners' dissatisfaction with American hull insurance. There have been instances where one owner has been given a higher moral rating and consequently a lower premium than another. We do not believe that the objection to the restricted "spread" of the American companies is justified. Certainly, if they were allowed to participate without restraint in the hull business, which will undoubtedly develop from the Jones-White Bill and similar measures, their capacity will show a healthy increase. It cannot be denied, however, that hull insurance rates and conditions are less favorable to the assured in this country than they are abroad. In fact the coverage upon most of the new tonnage built under the Jones-White Bill has been placed in foreign markets.

The causes for this differential are many and elusive. The average American does business on a show-window basis. The over-head and operating expense of a large American company with agents in every port and crossroads is tremendous in comparison with the limited agency system employed by English concerns. Lloyds, for example, does business from London. The agents of Lloyds do not write policies in this country. In fact our courts have repeatedly held that Lloyds

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA and SANSOME

JOSEPH HADLEY,
European Agent
13 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Resident Agent for Oregon
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE

FRANK G. TAYLOR, MANAGER, PACIFIC NORTHWEST BRANCH

brokers in this country are not actually agents at all, so that their business is to all intents and purposes operated solely from a head office. Add to these circumstances, a superior spread in the hull markets of the world and you have at least a few plausible reasons for the lower cost of foreign insurance.

Similar conditions in other branches of American endeavor have resulted in a protective tariff. The suggestion for protection of the American underwriter so as to put him on an even basis with his competitors would be laughed at, and yet the business of insuring our merchant marine is certainly as vital to the progress and economic independence of our country as the business of raising lemons, which is deemed worthy of the solicitous efforts of every hard-working politician in southern California.

Marine Insurance a Field of its Own

Unlike lemon growers, however, the marine insurance fraternity has heretofore refrained from those diplomatic efforts which are so necessary to produce favorable legislation under our democratic form of government. Furthermore, those whose capital is invested in insurance enterprises do not all vote in one legislative district; so that it is extremely difficult to gain that individual championship so essential to a vigorous political defense of American institutions.

Moreover, the marine underwriter's training has not been conducive to cooperative effort. Fire and life insurance companies have for years been reduced or advanced to that stage of development where rates and conditions are dictated by tables derived from the mortality records of decades and supported by the united front of the entire field of "respectable" companies. In comparison with these more standardized forms of protection, marine insurance is still a field for individual free-lancing. This, in some measure explains the difficulty which arose when last year's Congressional committee asked for statistics, which the underwriters were unable to furnish. A group of fire or life insurers would have been able to make up reams of statistics on short notice referring to any number of things the committee might wish and proving either side of the case desired. Your marine underwriter, not having the co-operative training of his brother insurers, is more apt to present Congressional investigation, especially when the investigators demand statistical records which do not exist. If other hearings are held before investigating committees it is to be hoped that the underwriters' representatives will adopt a more conciliatory attitude and make a strenuous effort to produce at least some statistics, whether they prove anything or not. If the investigators are offended (and

investigators are very easily offended) we may find our federal government sitting squarely in the midst of the marine insurance pool and then how can we tell our taxes from our premiums?

Peanuts, Mister?

GALVANIZED sheets and fishmeal may come and go, but that 1926 peanut crop goes on forever. It will be recalled—painfully, by some—that there have been numerous allusions, innuendos, and aspersions to the effect that Chinese peanuts of that vintage were, like the Democratic party, somewhat wetter than they should have been even before they got their sea legs.

Prior to the 1926 crop (which arrived on the Pacific Coast early in 1927) it was commonly considered that a properly house-broken and well-trained peanut should contain not over seven per cent moisture when dried and ready for shipment. Prominent surveyors and chemists have since testified that the average moisture content of the entire crop arriving here in 1927 was over nine per cent, and have attributed the excess to an unusually wet season in China, which prevented proper drying of the product.

As is customary in cases of damage by moisture, three separate theories of causation were advanced, depending on whether the theorizer owned a ship, a policy, or a peanut. These were that the damage was caused by:

- A. Inherent vice, or an excess of moisture before shipment, in which case nobody would be liable, save possibly the wily Celestial who raised the groundnuts, and if so, try and get it.
- B. Lack of ventilation due to poor storage, in which case the ship would be liable.
- C. Lack of ventilation caused by heavy weather, which made necessary the closing of all hatches and ventilators, in which case the marine insurer would be liable.

So far as we know, no suit has as yet actually come to trial on which a general precedent for liability can be based. Cases are now pending in Seattle, London, New York, and San Francisco against carriers and insurers of the notorious 1926 crop. It must be admitted, however, that conditions differ in each of the cases, both as to circumstances of the voyage and terms of the policy.

Claims aggregating some fifty thousand dollars were settled last year in San Francisco by a shipowner, three of whose vessels had touched at Honolulu and Vancouver on a voyage from Chefoo to San Francisco. The

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CHARLES R. PAGE, Manager
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

309 COLMAN BUILDING, SEATTLE, WASHINGTON

settlement was on a fifty per cent basis, and was actuated by a fear that the circuitous route of the voyage would be held to constitute a deviation, rather than from any guilty conscience as to poor stowage. As a matter of fact, the writer was on board two of those vessels while they were being discharged and can testify that the stowage was excellent. Rice ventilators and dunnage strips were used in profusion, and the cargo was blocked off in lots to insure ventilation, and yet the peanuts were mouldy throughout.

Quite recently a claim for some thirty thousand dollars against a Japanese insurer was settled for twenty-five per cent, upon a voyage where no deviation occurred. The policy agreed to pay for "damage from sweating and/or heating when resulted from external cause if amounting to 3 per cent on each bag." The primary reason for such a settlement was the difficulty in segregating the damage caused by an external agency from that due to inherent vice. Added to this, from the viewpoint of the assured, was the purely legal barrier constituted by the absence of American court jurisdiction over the underwriter. It is repeatedly brought to our attention that this barrier is one which the American importer holds too lightly. Insurance should be placed so that losses are legally collectable at destination.

And now a Seattle firm has filed suit in San Francisco for twenty odd thousand dollars against four British insurance companies, alleging damage by sweat and mould to various shipments of peanuts from the much-maligned 1926 crop. We understand that the policies in this instance purport to cover against sweat and mould, making no mention of external causes. However, no matter what the coverage, an insurer is not liable for inherent vice, and the old and well-known "vice propre" will be hard to get away from in this case.

The sad part of the whole story, from the insurer's standpoint, is that the 1927 crop, arriving here in 1928, turned out in excellent condition, but most of the underwriters had refused to take the business because of their sad experience the previous year.

Deviation, Subrogation, Litigation

IN an interesting and timely admiralty decision, the United States District Court for the Southern District of Texas recently held that stowage of lumber on deck under a clean bill of lading constitutes a deviation.

The case further holds that an assured who is paid a loss by his underwriters becomes a trustee of their subrogated rights, and cannot thereafter, without their consent, settle the claim with the third party who may be liable. (Southlands, 1928 A.M.C. 1613).

"The shipment being upon a clean bill of lading," runs the opinion, "it is conceded that stowage on deck amounts to a deviation, see Delaware, 81 U. S. 579; St. John's N.F., 280 Fed. 553; see also same case in Supreme Court, 1923 A.M.C. 1131, unless respondent can prove a custom of the port to so ship. Delaware, supra; West Aleta, 1925 A.M.C. 1427; same case 1926 A.M.C. 855; Gualala, 178 Fed. 402.

I have carefully examined the evidence in the light of the authorities and I find that the custom alleged and relied upon did not exist.

Respondent contends further that there was an accord and satisfaction growing out of the assertion by the Kirby Lumber Company and payment by the respondent of a claim for the amount of deck stowed lumber not jettisoned or washed overboard; but converted by the action of the ship at destination.

To this claim libellant replies (1) that there was no settlement of the claim in controversy, and (2) if there was, the libellant was powerless to effect the settlement, since, as plainly appears in the correspondence, libellant had been paid by its cargo underwriters for the lumber which was jettisoned and washed overboard, and the insurance companies having a right in law and under their contracts to subrogation to the claim of libellant against the carrier, libellant was without power to settle the claim, if it had attempted to do so.

I agree with libellant that the claim now in suit was never submitted for settlement or compromise, and that while the form of the release presented to but not signed by the Kirby Lumber Company covered all claims arising out of the cargo stowed on deck, there was never any contention between libellant and respondent as to the claim now in suit, and it would be giving effect to form, rather than substance, to say that the parties had under discussion, and made a compromise of, the claim in suit.

In addition, I think it plain that libellant had no authority to make such an accord and satisfaction, and that the evidence shows plainly that it was understood between libellant and respondent that this matter having been taken up with the insurance company was not then at issue between libellant and respondent."

Balfour, Kessler Agencies Inc.

Marine Insurance Department

Agents for

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NORTH CHINA

UNION OF CANTON
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BRITISH AND FOREIGN
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INSURANCE

BROKERS FOR THE ASSURED—AVERAGE ADJUSTERS

Activities of Underwriters' Study Class

The Marine Insurance Study class of the Association of Marine Underwriters of San Francisco held its first meeting of the eighth term on Monday evening, October 8, 1928, in Room 906 Merchants Exchange Building, there being thirty members present.

The speaker of the evening was the Honorable Arthur M. Free, member of the United States Congress from the Eighth District of California, who discussed maritime subjects, his contact with which was gained by an eight-year membership on the Merchant Marine and Fisheries Committee of the House of Representatives.

The speaker gave a brief resume of the history of the American merchant marine, pointing out that in 1910, American ships carried 8.7 per cent of our foreign trade, where as in 1830 American ships carried 80 per cent of the same trade. He touched upon the reasons for this sad state of affairs and commented on the necessity for some form of subsidy which would put the American shipowner on an equal basis with his foreign competitors. Mr. Free gave a back-stage view of the recent attempt of Commissioner Plummer of the United States Shipping Board to put the United States into the marine insurance business, and warned his listeners that this effort would be renewed. He further expressed the belief that some definite action would be taken at the next session of Congress with a view to adopting a uniform bill of lading.

The Study Class of the Association of Marine Underwriters, at their second meeting of the 1928 term, had the pleasure of hearing H. E. Durando of the American Credit-Indemnity Company outline the elementary principles of credit insurance. Mr. Durando gave a comprehensive outline of this little-known form of coverage, which he defined as being insurance to protect a merchant against losses by



R. W. Campbell, manager of the newly-opened Los Angeles office of Edward Brown and Sons

bad debts over and above his normal trade loss. Like other forms of insurance it is not designed to place the assured in a position where he will recoup his entire loss, but makes it possible for him to estimate and budget his losses at the beginning of his fiscal year. The speaker further pointed out that risks were classified in five divisions according to the degree of hazard attaching to the type of business and that the premium was based upon the debtor's rating in an agreed financial mercantile report such as Bradstreets or Dunns.

The second speaker of the evening was Cyrus Anderson of the firm of Anderson & Matoon, freight forwarders and cargo surveyors, who delivered an illustrated talk upon the proper care and handling of cast iron pipe during transportation. The reel of motion pictures accompanying Mr. Anderson's remarks was made by a member of his organization who followed a shipment of pipe from Birmingham, Alabama, to the Pacific Coast. The pictures show the methods of loading the pipe in cars, transshipping to the intercoastal vessel, and discharging at destination, together

with certain details of cutting off damaged lengths in salvage operations.

Seekers after knowledge who attended the third meeting of the class gained some valuable pointers on the lumber trade from Reuben W. Smith, field engineer of the National Lumber Manufacturers' Association, who discussed the transportation characteristics of various types of lumber produced on the Pacific Coast.

The speaker pointed out that moisture damage, due to being confined in the lower holds of vessels, was a difficult problem to overcome. In the overland shipments the problem is not so pressing, as the rail shipments consist largely of kiln dried products which are not susceptible to this type of damage. California pine is particularly liable to damage by moisture which normally manifests itself in the form of the so-called "Blue stain." This form of damage does not materially injure the lumber if it is to be painted; but it nevertheless results in a depreciation in the market value.

Mr. Smith expressed the opinion that some method of standardizing the moisture content of air dried lumber before shipment would improve the practicability of scientific underwriting on this commodity. He further favored a more extensive ventilation of holds in vessels carrying lumber on long voyages.

James A. Quinby, chairman of the class, delivered a short talk on the meaning and extent of the shipowners right to limit his liability to the value of his interest in the vessel.

Trade Literature

Winton Engines. This is a 68 page booklet printed on very fine coated stock and bound in an attractive paper cover. It has been issued by The Winton Engine Company, Cleveland, Ohio, as a testimonial to Winton Engines "Because they have thoroughly demonstrated their superior merit in actual service, supply the power in America's finest yachts, some of which are illustrated in this book."

In fact the book is a series of beautiful half-tone reproductions of some of the best-known and most beautiful yachts, schooners, and cruisers in America—63 in all—all powered with Winton diesel engines.



American Shipbuilding

A Monthly Report of Work in Prospect, Recent Contracts, Progress of Construction and Repairs

Edited by H. C. McKINNON

Details of the New Matson Steamships.

Details concerning the two liners to be built for the Matson Line's San Francisco-Australian service were made public Nov. 17 by A. C. Dierickx, vice-president of the Matson Navigation Company. Designs have been approved by the Navy Department and the United States Shipping Board. Bids will be called for shortly. The vessels will rate in class 2 under the Jones-White Merchant Marine Act, and will be capable of a sustained sea speed of 20 knots per hour.

It is expected that these vessels will cost in the neighborhood of \$13,000,000 and a substantial low interest loan will be made by the Shipping Board.

They will be twin-screw, with cruiser sterns, 625 feet long on the water line, with a beam of 77 feet 6 inches and a displacement of 26,000 tons.

Their propulsion machinery will be geared steam turbines, of a maximum horsepower of 25,000, with boiler pressure of 360 pounds, and superheaters of sufficient capacity to raise the steam temperature to 650 degrees.

All auxiliaries will be electrically operated, the generators for this purpose aggregating over 2000 horsepower.

Cooking will be done by electricity, and while the public rooms will be heated by steam and the quarters generally by heated air on the thermotank system, a large portion of the passenger quarters will be arranged for electric heating.

There will be accommodations for 460 first class, 200 second class, and 70 third class passengers, with spacious public rooms for each class.

Each vessel will have 25,000 cubic feet of refrigerated cargo space to carry fresh fruit and other California produce to Hawaiian, South Pacific, and Australian markets.

Public rooms will occupy an entire upper deck. This deck will also have a number of de luxe suites. There will be seven decks.

All first and second class state-rooms will have outside locations with windows and portholes, and will have twin beds instead of berths. There will be a Pompeian swimming pool.

Plans for the vessels were prepared by A. C. Dierickx, vice-president of the Matson Navigation Company, with the cooperation of the Navy Department, and assisted by G. K. Nichols, manager of engineering and repairs.

Both vessels have been planned for use in event of war as naval auxiliary ships.

While the recently signed Matson-Oceanic Line mail contract only requires completion of one vessel by October 1, 1931, and the second vessel by October 1, 1932, it is more than probable that both ships will be started simultaneously early in the new year in order to have both vessels in commission prior to October, 1931.

Being constructed under the revised regulations of the International Convention for Safety of Life at Sea, the ships will be practically unsinkable. As with the *Malolo*, their bulkheading will be so arranged that with any two compartments flooded to the level of the sea, the vessels will stay afloat at a reasonable draft.

When completed, the liners will replace the *Sierra*, *Sonoma*, and *Ventura*, which have been operating for more than 20 years between San Francisco, Honolulu, the Samoan and Fiji Islands, and Australia.

Although a type unlike the *Malolo*, the ships will have two funnels and clipper bows.

Million and Half Dollars In Ferryboats for Puget Sound

The increase in tourist travel to the "Evergreen Playground" bordering Puget Sound and the natural growth of the resident population has brought an important announcement from two of the leading transportation companies in Seattle regarding plans for ferryboat

construction to take care of next year's traffic.

The Puget Sound Navigation Company, Seattle, of which Ira Bronson is president, has announced that plans are being prepared by the Lake Washington Shipyards, Houghton, Washington, for two fine ferryboats. One of these will be used on the 7-hour run from Seattle to Victoria and will be turbo-electric powered, with accommodations for 500 passengers and 70 automobiles. This vessel will be used on night runs, so will require considerable equipment. The estimated cost is \$500,000.

A second boat, for the Seattle-Bremerton route, will be of a different type but modern in all respects. This vessel will carry 1000 passengers and 80 autos and will cost \$400,000. The company hopes that keels for the two boats will be laid shortly after December 1.

A further announcement of prospective ferryboat construction has been made by Captain J. L. Anderson of the Kitsap County Transportation Company, Seattle, and owner of the Lake Washington Ferries, to the effect that he plans two ferryboats. One of these will be of steel construction for Puget Sound service with accommodations for 90 automobiles and their passengers and will cost about \$200,000.

The second ferryboat, for Lake Washington ferry on the Medina route, will be of wooden construction, have accommodations for passengers and 90 automobiles, and will cost \$200,000. Both boats will be diesel engine powered.

Ward Line Plans Vessels

Theodore E. Ferris, naval architect at 30 Church Street, New York, is completing plans for the construction of two passenger and freight vessels for the New York & Cuba Mail Steamship Company of New York. The vessels will be built under the terms of the Merchant Marine Act, 1928, and the plans must pass the approval of the Ship-

ping Board and the Navy Department.

The vessels will be 508 feet long, 59.8 feet beam, 26 feet draft, and will be powered with steam turbines connected to twin screws by double reduction gearing. The vessels will have accommodations for 378 first class and 90 second class passengers and will have a speed of 18 knots.

Colombian Line Plans New Tonnage

Another New York steamship line which is planning the addition of new tonnage to its fleet under the mail subvention subsidy and Shipping Board loan fund is the Colombian Steamship Company, Inc., 17 Battery Place.

This line has plans prepared for three 400-foot steamers to accommodate about 200 passengers, and it is reported plans and specifications will be issued to shipyards as soon as a mail contract with the Post Office Department has been signed.

Diesel Powered River Vessels

The Hudson River Night Line, New York, has asked shipyards to bid on two diesel-powered overnight automobile, freight and passenger vessels for its New York-Albany service. Bids will be opened at the office of Henry J. Gielow, 30 Church Street, New York. These vessels will be 325 feet long, 58 feet beam, and 23 feet depth, with twin diesel engines connected to propellers.

Bids Opened On Survey Boat

The United States Coast and Geodetic Survey opened bids recently for the building of a survey boat for Alaskan waters. Low bid was submitted by the Albina Marine Iron Works, Portland, Oregon, being \$56,470.

Lake Ferryboat to Be Built

The British Columbia Public Works Dept., Victoria, B.C., have asked for bids for the construction of a wooden ferryboat for service on the Kootenay Lake. The boat will be 88 ft. long, 33 ft. breadth, 4 ft. 7 in. depth, 45 horsepower internal combustion engine. Boat will carry automobiles and passengers.

Dominion Government to Build Ice Breaker

Contract has already been awarded for the construction of an ice-breaking steamship for Hudson

Strait to the Halifax Shipbuilding Co.

Tenders have been invited for the construction of a second vessel, the general dimensions being 200 feet long, 42 feet breadth, 21 feet depth, with steam engines of 3000 indicated horsepower. \$600,000 has been appropriated for the construction of this vessel, which will be for use on the St. Lawrence above and below Quebec.

Dominion Government Plans Ferryboat.

Naval constructor C. F. M. Duquid of the Canadian Department of Marine, Ottawa, is drawing up plans and specifications for a passenger and automobile ferryboat for operation across Northumberland Strait between Tormentine, New Brunswick, and Borden, Prince Edward Island. The vessel will be similar to the Prince Edward Island now in service.

Bids Opened by Export Line for Four Vessels

Bids were opened November 5 by Donald and Sharp, 30 Church

street, New York, naval architects for The Export Steamship Corporation, 25 Broadway, New York, for the construction of four passenger and freight steamers for the American Export Lines. Seven Atlantic Coast yards submitted bids, ranging from \$1,990,750 to \$3,246,000. The proposals covered alternative designs and considerable analysis will be necessary before award of contract can be announced.

It is reported that the Spear Engineers, Inc., of Norfolk, was low bidder; also that Sun Shipbuilding Company submitted a bid of \$9,440,000 covering four diesel powered vessels.

These vessels are to be built under the provisions of the Merchant Marine Act, 1928, a loan covering three-fourths the cost of the vessels and a mail subvention having already been contracted for with the Shipping Board by the Post Office Department. The vessels will have the approximate dimensions of 450 feet length, 61 feet 6 inches breadth, 42 feet 3 inches depth, 8200 gross tons, and 9500 tons deadweight on 27 feet 10 inches draft.

Recent Shipbuilding Contracts

General Engineering & Drydock Co., Alameda, Calif., has an order from the Standard Oil Co. (Calif.), San Francisco, for an oil tow barge, 72 x 24 x 4 ft. of 100 D.W.T.

This yard also has an order from A. Paladini, Inc., San Francisco, for a diesel-powered fishing boat 65 L.O.A.; 16 ft. beam; 6 ft. loaded draft.

Charleston Drydock & Machinery Co., Charleston, S. C., has received contract from the Dept. of Commerce, Bureau of Lighthouses, Washington, D.C., for three lightships, Nos. 115, 116, and 117. The dimensions of these ships are 133 ft. 3 in. over-all, 30 ft. beam; 12 ft. 6 in. draft; to be powered with diesel-electric machinery. This company bid \$554,766 and 660 days time for the work.

Midland Shipbuilding Company, Midland, Ontario, has an order from Canada Steamship Lines, Ltd., for a single-screw package freighter to be 250 ft. between perpendiculars, 42 ft. 9 in. beam, 14 ft. loaded draft, powered with triple expansion steam engines developing 1300 indicated horsepower; 2 Scotch boilers. Keel is to be laid December 1.

Midland Barge Company, Midland, Pennsylvania, has an order

from the Pittsburgh Plate Glass Co. for four barges 135 x 26 x 10 ft.

New York Shipbuilding Co. (formerly American Brown Boveri Electric Corp.), Camden, N. J., has an order from W. R. Grace & Co., New York, for a combination passenger and cargo vessel, 482 ft. 9 in. long, 63 ft. 9 in. beam, 37 ft. 5 in. depth. Contract was signed October 29 and further details were not available up to this date.

The vessel will have turbo-electric drive, delivering 12,000 shaft horsepower and developing a speed of 18 knots. She will have accommodations for 175 first class passengers and capacity for 7000 tons of freight. All auxiliary equipment will be electrically operated.

The vessel will be practically a sister ship to the recently completed Santa Maria and Santa Barbara, and will be built under the provisions of the Merchant Marine Act, 1928.

Nashville Bridge Co., Nashville, Tenn., has an order for a diesel towboat from the Central Sand Co., to be 120 x 26 x 5½ ft.; this yard is also preparing to build five barges and one ferryboat, all new orders since October 1.

George Lawley & Son Corp., Niponset, Mass., builder of a large

number of modern heavily powered seagoing yachts and schooners, has an order for a steel barkentine 206 ft. long to be powered with diesel engines for Walter P. Murphy of New York. Arthur B. Raymond of Montclair, N.J., is the designer.

This yard has also received an order from Henry J. Gielow, Inc., naval architect, New York, for a three masted schooner yacht 216 feet long, with auxiliary diesel engines.

Newport News Shipbuilding & Drydock Co., Newport News, Va., has received an important contract from the Dollar Steamship Company of San Francisco for reconditioning work to be done on four steamers. The work will aggregate a cost of around \$2,000,000.

The most important job will be the entire rebuilding of the passenger accommodations of the steamer Manchuria, to be renamed the President Johnson. Three liners in the round-the-world service will have passenger accommodations enlarged, redecorated, and refurnished with modern equipment.

Davie Shipbuilding & Repairing Co., Lauzon, Quebec, has an order from Canada Steamship Lines, Montreal, for a freight steamer 250 ft. between perpendiculars, 42 feet 9 inches beam, 26 feet 6 inches depth, 2380 gross tons, 12 miles loaded speed.

Halifax Shipbuilding Co., Halifax, N.S., has received contract from the Canada Department of Marine, Ottawa, for an ice-breaker steamship to operate on the St. Lawrence Gulf and Hudson Bay. Contract price is \$1,220,000. The ship will be 260 feet long, 60 feet beam, 19 feet 6 inches depth; twin screws; triple expansion steam engines; 6 single Canadian-Scottish boilers to burn coal or oil. She is to be built to Lloyds 100 A-1 classification.

Bids have been asked for a smaller vessel of the same type.

Bethlehem Shipbuilding Corp., Ltd., San Francisco, has an order from the Inter-Island Steam Navigation Company of Honolulu for two additional vessels, making a total of four vessels for this company on order at the San Francisco yards of Bethlehem. The latest order is for a tugboat and for a steel barge for hauling pineapples.

Howard Shipyards & Dock Co., Jeffersonville, Ind., has an order from the U.S. Engineers, Vicksburg, for a 64-foot diesel towboat.

Bids Received on Reconditioning of Mt. Vernon and Monticello

Bids for reconditioning the steamers Mt. Vernon and Monticello were opened October 9 in the office of the Maintenance and Repair Division of the Merchant Fleet Corporation, New York, by Captain R. D. Gatewood. Six shipyards bid on twelve propositions for the conditioning of these liners for transatlantic service, four of the propositions having been prepared by Newport News Shipbuilding and Drydock Co. and eight of them by Gibbs Bros., Inc., naval architects of New York.

Lowest bid was submitted by Newport News Shipbuilding & Drydock Co. on one proposition only—that of converting the Mt. Vernon to geared turbine drive with Scotch boilers, \$5,850,000.

Bethlehem Shipbuilding Corp. bid on four propositions submitted by Newport News, covering geared turbine drive and turbo-electric drive, costs ranging from \$6,500,000 to \$6,800,000 covering either vessel.

Morse Dry Dock Co. submitted four bids for reconditioning the Mt. Vernon as specified by Gibbs Bros., covering compound double reduction geared turbines and turbo-electric drive, prices being \$6,610,000 and \$6,660,000 for water-tube boilers and \$6,405,000 and \$6,440,000 for Scotch boilers.

Sun Shipbuilding & Drydock Co. bid on reconditioning of the Monticello under the same propositions as those of the Morse company on the Mt. Vernon, costs ranging from \$7,734,000 to \$7,822,000 on water-tube boilers and \$7,507,500 and \$7,595,000 for Scotch boilers.

Bethlehem Shipbuilding Corp., Ltd., San Pedro, has contract to repair the Norwegian motorship Leikanger, which was injured in a collision with a battleship off port.

Park & Kibele, San Pedro, have order to repair the tanker Santa Maria which suffered some damage while on her last voyage due to a heavy storm at sea.

The Moore Dry Dock Company, Oakland, Calif., was awarded contract for repairs to the U. S. Transport Somme recently on low bid of \$53,822. Other bids submitted were: United Engineering Co., \$93,223; Bethlehem Shipbuilding Corp., \$67,410; Mare Island Navy Yard, \$76,932.

Yarrows, Ltd., Victoria, B.C., was

Tietjen and Lang Drydock Co. bid on all propositions in the reconditioning schedule, except that for direct diesel drive, and on both steamers. Costs ranged from \$6,640,000 to \$7,925,000 on the Newport News proposals to \$8,880,000 to \$9,638,000 on the Gibbs proposals.

The United States Navy Yard at Boston also submitted estimates for reconditioning. These covered the Mt. Vernon only, and were according to Gibbs specifications, costs ranging from \$6,754,269 to \$7,160,455.

In analyzing the above bids, the differences in cost of converting these vessels to geared turbine or turbo-electric drive do not seem to be in excess of \$225,000, or a cost of 3 per cent in favor of the geared turbine form of propulsion. Of course a direct comparison of the costs cannot be accurately made from the figures submitted, as the amount of equipment and material specified under the Newport News propositions and the Gibbs propositions to be supplied by the owner are quite different.

ERRATA

In the September issue of Pacific Marine Review it was erroneously stated that the fishing vessels Nordby and Northern Queen are engaged by other than Washington-Estep diesels. We are now advised that the Nordby is powered with a 100-horsepower Washington-Estep diesel and the Northern Queen has a 90-horsepower Washington-Estep diesel; both vessels giving excellent service.

News From the Shipyards

awarded contract November 3 for repairs to the British steamship Seapol, which was damaged when she struck a rock on the west coast of Vancouver Island, October 25. A number of Pacific Coast shipyards bid on the work. Yarrows bid \$42,000.

This plant is also repairing the steamer Oaxaca for her new owners, Hobbs Bros., Ltd., on a bid of \$18,000. The vessel was stranded in Wrangell Narrows several months ago on a pleasure cruise to Alaska, and was subsequently sold by G. Allan Hancock. She is suitable for coastwise trade, and has accommodations for 168 passengers.

It is reported that the Malolo,

which has been in service over a year, will have a large expenditure of money made on alterations following her present goodwill voyage from the Northwest to Hawaii. Her ballast tanks will be changed, her swimming tank altered, and many changes made in her dining room, it is reported. The work will probably be done at the Bethlehem plant.

It is reported that transformation of the Los Angeles Shipbuilding & Drydock Corporation, with shipbuilding and repairing plant at San Pedro into the Southern California Shipbuilding & Drydock Corporation is now under way. It is believed that the reorganization will strengthen the financial condition of the company and will permit bidding on some of the new liner construction for Pacific Ocean service.

The General Engineering & Dry-

Progress of Construction

The following report covers the Shipbuilding Work in Progress at the leading shipyards of the United States as of November 1, 1298.

Pacific Coast

ALBINA MARINE IRON WORKS Portland, Oregon.

Purchasing Agent: J. W. West.

Hull No. 100, diesel-electric lightship for U.S. Dept. of Commerce; 133'3" length overall; 30' beam. Winton diesel engs. General Electric motors; keel Sept. 1/28 est.

Hull No. 113, lightship, sister to above; keel Sept. 1/28 est.

Hull 114, lightship, sister to above; keel Sept. 1/28 est.

BALLARD MARINE RAILWAY COMPANY, Seattle, Washington

Mikimiki, hull J 91, tugboat for Young Brothers, Ltd., Honolulu; 115 L.B.P.; 28 beam; 12 draft; 11 knots speed; 1040 Fairbanks-Morse diesel engs.; keel Sept. 12/28.

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT

Potrero Works, San Francisco

Purchasing Agent: C. A. Levinson.
Not named, hull 5336, passenger and freight steamer for Inter-Island Steam Navigation Co., Honolulu; 295 L.B.P.; 27'6" beam; 17'6" loaded draft; 15 knots speed; 1200 D.W.T.; steam turbines; 4000 S.H.P.; 4 W.T. boilers; keel Dec. 27/28 est.

Not named, hull 5337, steel tank barge for Standard Oil Co. (Calif.), San Francisco; 100 L.B.P.; 23'5" beam; 50' loaded draft; 2 gas engines; 100-125 B.H.P. each; keel Nov. 5/28 est.

Not named, hull 5338, steel passenger and freight steamer for Inter-Island Steam Navigation Company, Honolulu; 1100 Gr. tons.

GENERAL ENGINEERING & DRY DOCK CO Alameda, Calif.

Purchasing Agent: A. Wanner.
Catherine Paladini, hull 16, fishing boat

dock Company has moved to its newly acquired plant at the foot of Fifth Street, Oakland, and has started a development program which will entail a total expense of \$1,500,000, and will provide San Francisco Bay with one of the most modern shipyards in the country. The plans include the construction of a large drydock for the handling of vessels up to 20,000 tons displacement, a floating dry-dock, and the extension of the three wharves 200 feet out into the estuary to provide docking.

The McCormick Steamship Company, San Francisco, has announced that contemplated improvement of its fleet of vessels in the South American trade will include installation of refrigeration facilities and improvement of passenger accommodations. The company is planning to bid on mail hauling contracts to be let by the Postoffice Department.

for A. Paladini, Inc., San Francisco; 78' x 18'6" x 6'6"; 10 loaded speed; 200 H.P. Atlas-Imperial diesel eng.; launched July 14/28; delivered July 31/28.

Hulls 17 and 18, mud scows for Board of State Harbor Comm.; 102 x 29 x 9'3"; delivered July 31/28.

Hull 19, tow barge for Standard Oil Co. (Calif.), San Francisco; 72 L.B.P.; 24' beam; 4' loaded draft; 100 D.W.T.

Not named, hull 20, fishing boat for A. Paladini, Inc., San Francisco; 65' L.O.A.; 16 beam; 6 loaded draft; 125 H.P. 5-cyl. Union diesel eng.; keel Oct. 19/28.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wash.

Scow same as above launched Aug. 13/28.

One scow for Salmon Bay Sand & Gravel Co., Seattle; 100x36x10 ft.

THE MOORE DRY DOCK CO. Oakland, California.

Purchasing Agent: N. Levy.

One steel carfloat for Western Pacific Railroad, San Francisco; 258' L.O.A.; 38' beam over-all; 12'6" molded depth; 799' loaded draft; capacity 14 80-ton cars; launch Sept. 28/28; delivered Oct. 28/28.

One steel carfloat for Atchison, Topeka & Santa Fe Railway, San Francisco; 260 L.O.A.; 38' beam over all; 12'6" depth midships; capacity 14 80-ton cars; launch Oct. 10/28 est.; deliver Nov. 10/28 est.

One steel clam shell dredger for Board of State Harbor Commissioners, San Francisco; 90 x 41 x 12'9"; launch Oct. 10/28 est.; deliver Nov. 30/28 est.

Not named, one steel, screw double-ended diesel-electric automobile ferryboat for San Diego and Coronado Ferry Co.; 104' L.O.A.; 43'6" breadth of hull at deck; 60' breadth over guards; 14'9" depth at sides, molded 8'11" light draft, molded keel Dec. 20/28 est.; deliver Apr. 20/29 est.

PRINCE RUPERT DRYDOCK & SHIPYARD Prince Rupert, B.C.

One steel car barge for Canadian National Railway, Vancouver, B.C.; 270 x 42 x 12' depth; keel Sept. 12/28; deliver Jan. 10/29 est.

Wooden tug for John Currie & Son; 40 x 12 x 6 ft.; keel Oct. 1/28.

U. S. NAVY YARD, Bremerton, Wash.

Not named, light cruiser CL-28 for United States Navy, 10,000 tons displacement; keel July 4/28; deliver Mar. 13/31 est.

Atlantic, Lakes, Rivers AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Nine coal barges for Union Barge Line, 17'5x26x11'.

Thirty Mississippi River Commission barges for; 120x30x7'.

One acid barge for American Steel Wire Co.; 100x26'7 ft.

One towboat hull for Tennessee Coal, Iron & R.R. Co.; 140x25x9'; delivered Oct. 12/28.

Two barges for Anderson Tully Co., Memphis; 160 x 34 x 7 ft.

Twelve barges for Crucible Fuel Co., Pittsburgh; 175 x 26 x 11 ft.

BATH IRON WORKS Bath, Maine

Vanda, hull 117, twin screw steel diesel yacht; 240'x36'x22'; two 1500-B.H.P. Bessemer diesel engs.; keel Feb. 3/28; launched Oct. 3/28; delivered Nov. 1/28.

Boston College, hull 119, single screw steel diesel trawler for Atlantic & Pacific Fish Co., Boston; 123'x23'x14'; 400 B.H.P. Fairbanks-Morse diesel engine. Bath Iron Works design. Keel June 14/28; launched Oct. 17/28; delivered Nov. 2/28.

Holy Cross, hull 120, trawler, same as above; keel June 14/28; launch Nov. 24/28 est.; deliver Nov. 27/28 est.

Georgetown, hull 121, trawler, same as above; keel June 14/28; launch Dec. 12/28 est.; deliver Dec. 15/28 est.

Paragon, hull 122, twin screw steel diesel yacht; 138'3"x19'2"x12'6"; 2 350-B.H.P. Winton diesel engs. A. L. Swasey designer. Keel Oct. 15/28 est.; launch Apr. 10/29 est.; deliver May 1/29 est.

Hi-E-Maro, hull 123, twin screw steel diesel yacht, Henry J. Gielow, Inc., New York, designer; 266'x35'x22' depth; 14'6" draft; two 1200 B.H.P. Bessemer diesel engs.; keel Nov. 15/28 est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT, Quincy, Mass.

Chelon, diesel-elec. cutter for U.S. Coast Guard Service; 250x42x15 ft.; Westing-

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and Lubricating Oils

Holbrook Building, San Francisco
Cables-Radio, "CROZIENGER"

house turbines and motors; 3000 S.H.P.;
launched May 19/28; deliver Aug. /28 est.
Tahoe No. 46, sister to above.
No. 47, sister to above.
No. 48, sister to above.
No. 49, sister to above.

Not named, hull 1418, steel passenger
and freight steamship for the Pennsylvania
Railroad Co., West Philadelphia; 300 ft.
length; TE engs.

Not named, hull 1419, steel trawler for
Mass. Trawling Co.; 116 ft. long; 460 gro.
tons.

Not named, hull 1420, sister to above.
Hull 1421, boat for R. O'Brien & Co.;
230 gr. tons.

Not named, Hull 1422, single-screw coal
collier for Berwind-White Coal Mine Co.
1 Broadway, New York; Theo. E. Ferris,
designer; 350 L.B.P.; 50 beam; 23'6" draft;
10,020 tons displacement at 25'3" draft;
10 1/2 knots speed; Hoover, Owens, Rent-
schler recip. st. eng.; 2200 S.H.P.; 2 Scotch
boilers.

Not named, hull 1423, sister to above;
Bethlehem-Curtis turbines; 1700 S.H.P.;
2 WT. boilers.

CHARLESTON DRYDOCK & MACHINERY CO., Charleston, S.C.

No. 115, diesel-electric lightship for U. S.
Dept. of Commerce, Bureau of Lighthouses,
Washington, D.C.; 133'3" L.O.A.; 30'
beam.

No. 116, same as above.

No. 117, same as above.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2921, 106-ft. cruiser for L. M.
Wainwright, Indianapolis; 2 Speedway die-
sels, 300 H.P. ea. at 700 r.p.m., wt. 7500
lbs.; deliver May/29 est.

Hull 2923, 66-ft. cruiser for J. McMillan,
Detroit, Mich.; 2 170-H.P. Speedway engs.;
deliver May/29 est.

Not named, hull 2925, 64-ft. cruiser for
Rear Admiral L. M. Josephthals, New York;
2 170-H.P. Speedway engs.; deliver May/29
est.

Not named, hull 2926, 76-ft. cruiser for
Adolph M. Dick, New York; 2 300-H.P.
Speedway engs.; deliver June /29 est.

DEFOE BOAT & MOTOR WORKS, Bay City, Mich.

Purchasing Agent: W.E. Whitehouse.

Barbett, hull 130, wood yacht for C.
A. Caryell, Bay City; 90 L.B.P.; 17 beam;
4 loaded draft; 12 mi. loaded speed; 75
D.W.T.; 200 L.H.P. diesel eng.; keel June
20/28; launched Nov. 1/28; deliver Nov.
15/28 est.

Not named, hull 131, steel yacht, owner
not named; 105 L.B.P.; 17 beam; 6 loaded
draft; 14 mi. loaded speed; 110 D.W.T.;
250 H.P. diesel eng.; keel Aug. 1/28;
launch Nov. 1/28 est.; deliver June 1/29
est.

Not named, hull 132, wood yacht for C.
W. Bonbright, Flint, Mich.; 61 L.B.P.;
13 beam. 4 loaded draft; 18 m.p.h.; 300

L.H.P. gas eng.; keel Oct. 15/28; launch
Apr. 15/29 est.; deliver May 1/29 est.

DRAVO CONTRACTING COMPANY, Pittsburgh, Pa., and Wilmingtgon, Del.

Hull 614, diesel engined towboat for
stock, 125'6" x 26'6" x 5'6".

Hulls 691-694 inc., four steel carfloats for
New York Central Railroad Co.; 270x38
x10'5"; 850 gro. tons ea.

Hulls 722-23, 2 standard steel barges
for stock; 130'x30'x7'6"; 250 gr. tons ea.
Hull 734, steel hull derrick barge for
Meritt, Chapman & Scott, Corp.; 116 x 43
x 12 ft.

Hulls 739-740, two steel snag barges for
U.S. Engineers, Memphis; 84 x 24 x 3'6".

Hull 741, oil barge for Atlantic, Gulf &
Pacific Co.; 80 x 30 x 8 ft.

Hulls 744-752 inc., 9 steel hopper barges
for Union Barge Line Corp., Pittsburgh.
175 x 26 x 11 ft. 4 delivered.

Hulls 753-784 inc., 32 standard Missis-
sippi River Comm. barges for Memphis of-
fice delivered.

Hulls 787, 788, two steel house barges
for Merchants and Miners Transp. Co.; 120
x 30 x 7 ft.

Hulls 789, 790, 791, three standard barges
for Ohio River, Sand Co., Louisville, Ky.;
130 x 30 x 7'6".

FEDERAL SHIPBUILDING & DRY DOCK COMPANY Kearny, N. J.

Purchasing Agent, R. S. Page.

Hull 104, oil barge for Oil Transfer
Corp.; 175'x35'x12'5"; keel Oct. 16/28.

Hull 105, oil barge for above; 146'x34'8"
x10'2 1/4".

Hull 106, lighter hull for J. W. Sullivan
Co.; 121'x32'6"x13'4 1/2".

HOWARD SHIPYARDS & DOCK COMPANY, Jeffersonville, Ind.

Purchasing Agent, W. H. Dickey.

Hulls 1647-1655 inc., nine steel needle
flats for U. S. Engineers, Louisville, Ky.;
40'x14'x3'6"; 4 keels laid Aug. 7/28; 5 keels
Sept. 12/28; delivered Oct. 14/28.

Hulls 1656-7, two barges for Mississippi
River Comm., New Orleans, 120'x30'x7'6".

Not named, hull 1658, towboat for U. S.
Engineers Dept., Vicksburg, Miss.; 64'10" x
18'x3'10"; 100 H.P. diesel eng.

MANITOWOC SHIPBUILDING CORPORATION Manitowoc, Wis.

Purchasing Agent, H. Meyer.

Hull 244, diesel-electric dipper dredge
for Great Lakes Dredge & Dock Co.; 156
L.B.P.; 43 beam; 10 ft. draft aft; keel Aug.
30/28; launch Jan. 1/29 est.; deliver June
1/29 est.

MARIETTA MANUFACTURING COMPANY

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

Hull 234, sternwheel oil barge for Tropi-
cal Oil Co.; 203'x44'x5'6"; Marietta tam-
den comp. eng. 14'x28'x8'4"; keel July
18/28; deliver Nov. 15/28 est.

Hull 235, sister to above; keel Aug.
1/28; deliver Dec. 15/28 est.

WM. CORNFOT, President

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MIDLAND BARGE COMPANY

Midland, Pa.

One dredge hull for M. H. Treadwell Co. of New York; 150'x70'x13'6".

Six oil barges for International Petroleum Co., Toronto; 125'x30'x7'; 3 launched.

Three fuel barges for Union Barge Line Corp., Pittsburgh; 100x24x8 ft.

Four line barges for U.S.A. Engineers, Vicksburg.

Four barges for Pittsburgh Plate Glass Co., Pittsburgh; 135x26x10 ft.

MIDLAND SHIPBUILDING CO., LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Not named, hull 23, single screw package freighter for Canada Steamship Lines, Ltd.; 250 L.B.P.; 42'9" beam; 14' loaded draft; 12 mi. speed; 2200 D.W.T.; TE steam; 1300 I.H.P.; 2 Scotch boilers. 14'6" dia. x 11' long; keel Dec. 1/28 est.; launch Apr. 1/29 est.; deliver May 1/29 est.

NASHVILLE BRIDGE COMPANY,

Nashville, Tenn.

Purchasing Agent, Leo. E. Wege.

Hull 149, towboat for Standard Unit Nav. Co.; 92x24x5 ft.; keel May 10/28; launch Jan. 1/29 est.

Hulls 156 to 160 inc., five cargo barges for stock; 98 L.B.P.; 17 beam; 6 loaded draft; keels laid Aug. 22 and 27; all launched; deliver Nov. 26/30 est.

Hull 161, ferry hull for stock; 150 L.B.P.; 62 beam; 8 loaded draft; keel Sept. 16/28; launch Nov. 15/28 est.

Hull 162, deck barge for stock; 160 x 32 x 7 ft.; keel Sept. 25/28; launched Oct. 30/28.

Not named, hull 163, ferryboat for Davidson County, Tenn.; 60 L.B.P.; 16 beam; 3 loaded draft; keel Oct. 15/28.

Hull 164, deck barge for stock; 120x30x7 ft.; keel Sept. 28/28.

Hull 165, same as above; keel Oct. 10/28 est.

Hull 166, dredge for stock; 80 L.B.P.; 36 beam; 6 loaded draft; keel Nov. 15/28 est.

Hull 167, deck barge for stock; 110 x 28 x 7 3/4'; keel Dec. 15/28 est.

Hull 168, deck barge for stock; 110 x 28 x 7 3/4'; keel Dec. 15/28 est.

W. W. Fischer, hull 169, diesel towboat for Central Sand Co.; 120x26x5 1/2 ft.; 720 I.H.P.

Hull 170, deck barge, 100x28x7 1/4 ft.

Hull 171, deck barge, 100x24x5 ft.

Hull 172, same as above.

Hull 173, deck barge, 100x26x6 1/2 ft.

Hull 174, same as above.

Hull 175, ferryboat, 60x18x2 1/4 ft.

Hull 176, barge, 100x26x6 1/2 ft.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plummer, 233

Broadway, New York City.

Houston, hull 323, light cruiser CL-30 for United States Navy; 10,000 tons displacement; keel May 1/28; deliver June 13/30 est.

Augusta, hull 324, light cruiser CL-31 for United States Navy; 10,000 tons displacement; keel July 2/28; deliver Mar. 13/31 est.

Virginia, hull 326, 18-knot express passenger liner for Panama Pacific Line; 613'3" L.O.A.; 80' beam; 52' depth; two turbine-driven electric motors; 8 Babcock & Wilcox water-tube boilers; keel Nov. 14/27; launched Aug. 18/28; deliver Nov. 26/28 est.

Not named, hull 329, sister to above; keel Oct. 15/28.

Not named, hull 328, steel yacht for Geo. F. Baker, Jr.; 272'1" L.O.A.; 36'6 3/4" beam; 18'6" depth; two turbine driven G.E. motors; 2 Babcock & Wilcox WT boilers; 1200 gross tons; 2600 S.H.P.; keel July 3/28; launch Dec. 15/28; deliver Apr. /29 est.

NEW YORK SHIPBUILDING CO.

Camden, N. J.

Salt Lake City, light cruiser for United States Navy; 10,000 tons displacement; deliver July 9/29 est.

Chester, light cruiser CL-27 for United States Navy; 10,000 tons displacement; keel Mar. 7/28; deliver June 13/30 est.

Hull 378, steam lighter for Pennsylvania Railroad Co.; keel Sept. 1/28; launch Nov. 30/28 est.; deliver Dec. /28 est.

Hull 379, carfloat for Pennsylvania Railroad Co.; keel Aug. 11/28; launched Oct. 16/28; delivered Oct. 29/28.

Hull 384, carfloat for Pennsylvania Railroad Co.; keel Aug. 11/28; launched Oct. 1/28; deliver Oct. 11/28.

Not named, hull 387, passenger and cargo steamer for W. R. Grace & Co., New York; 482'9" long; 63'8" beam; 37'5" depth.

THE PUSEY & JONES CORP.,

Wilmington, Del.

Purchasing Agent: James Bradford.

P.R.R. No. 17 and L.I.R.R. No. 1, hulls 1037, two harbor tug hulls for Pennsylvania Railroad Co.; 105' L.O.A.; 24' beam; 13'9" molded depth; keels July 12/28; launched one Oct. 15/28; launched one Oct. 27/28; deliver Nov. 10/28 est.

Not named, hull 1038, twin screw diesel yacht for Arthur E. Wheeler, New York; 126 L.O.A.; 21'6" beam; 8'6" app. loaded draft; 2 250 B.H.P. diesel engs.; keel Oct. 18/28; deliver April 15/29 est.

THE SPEAR ENGINEERS, INC.,

Plant, Portsmouth, Va.

Office, Bankers Trust Bldg., Norfolk, Va.
General Charles F. Humphrey, hull 1,

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John Crane Packing
Foster Super-Heater Parts
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WILMINGTON, CALIF.

screw double-end ferryboat for Quartermasters Corp., U.S.A.: 99' L.B.P.; 44' beam; 9'6" loaded draft; 10 1/2 mi. speed; 600 D.W.T.; Fairbanks-Morse direct diesel drive; 450 I.H.P. eng.; keel July 13/27; launched June 16/28.

John M. Dennis, hull 2, screw double-end ferryboat for Claiborne-Annapolis Ferry Co.: 198' L.B.P.; 60' beam; 90'0" loaded draft; 14 mi. speed; 1188 D.W.T.; Fairbanks-Morse direct diesel drive; two 450-I.H.P. engs.; keel Feb. 18/28.

Hydrographer, hull 3, steel diesel-electric survey boat for U.S. Coast and Geodetic Survey, Washington, D.C.: 167'5" L.O.A.; 143' L.B.P.; 31'6" molded beam; 18'2" minimum depth to top of main deck at side; 740 tons displacement molded at 10'6" mean draft; 9'6" draft, forward; 11'6" draft, aft; 2' drag; 240-horsepower Winton diesel engines; Westinghouse generators and auxiliaries; 640 B.H.P. West. propelling motor, keel Aug. 18/28.

Not named, hull 4, diesel-electric ferryboat for Norfolk County Ferries, Portsmouth, Va.: 173' L.O.A.; 146' L.B.P.; 57' beam over-all; 37' beam of hull at deck; 14' molded depth; 8'6" draft; two 400 B.H.P. Bessemer diesel engs.; one General Electric 270-kilowatt generators; one General Electric propelling motor of 650 H.P.

SPEDDEN SHIPBUILDING CO. Baltimore, Maryland.

Purchasing Agent: W. J. Collison.

Not named, hull 264, fire and patrol boat for Commissioners, Washington, D.C.: 55' L.O.A.; 11'9" molded beam; 6'9" molded depth; 5' loaded draft; 31 D.W.T.; 100 H.P. Standard diesel eng.; keel Aug. 25/28; launch Nov. 20/28 est.; deliver Dec. 1/28 est.

STATEN ISLAND SHIPBUILDING CO. Mariner's Harbor, N.Y.

Purchasing Agent: R. C. Miller.

Not named, hull 781, ferryboat for Dept. of Plant and Structure, City of New York: 267' long; 66' breadth over guards; 46' molded beam; 19'9" molded depth; comp. engs.; 4000 I.H.P.; W. T. boilers; keel July 2/28.

Hull 782, barge for Grasselli Chemical Co.: 150 x 32 x 2'6".

TODD DRYDOCK, ENGINEERING & REPAIR CORP., Brooklyn, N.Y.

Purchasing Agent: H. J. Shannan.

Not named, hull 45, steel double-end ferryboat for City of New York, Dept. of Plant and Structure: 151 L.O.A.; 53 beam over guards; 37'6" molded beam; depth to top of beams 14'3"; draft 8'3"; steam engs.; keel Nov. 1/28.

TOLEDO SHIPBUILDING CO. Toledo, Ohio

Purchasing Agent: Otto Hall.

Hull 179, dump scow for Central Dredging Co.: 144 x 42 ft.

Hull 180, same as above.

THE CHARLES WARD ENGINEERING WORKS Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Dwight W. Davis, hull 69, steam propelled towing boat for Inland Waterways Corp., Washington, D.C.: 140x25x9 ft.; 2 500-H.P. Nordberg engs.; equipped to burn powdered coal, keel July 23/28.

Captain George, hull 73, single screw tugboat for U. S. Engineer Office, Galveston: 65'6"x17'x7 1/2'; 190 B.H.P. Winton diesel eng.; keel Oct. 16/28.

Tom Stellings, 74, Western river type, steam driven 30-ton snag boat for Memphis River and Harbor District, U.S. Army engineers: 127'x30'x4'4".

Hulls 75-76, two stern-wheel towboats

for stock: 64'9"x18'x4'5"; diesel eng.; keel Oct. 12/28.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD.

Drydock, paint, misc. repairs: stms. Admiral Evans, S. Kentuckian, S. J. Moffett, Stockton, Salina, Ventura, Chetopa, U.S.C.G.C. Golden Gate, pilot boat Adventurers, tug F. A. Douty, stms. Maunawili, Makua, San Jose, Matsonia (1 manganese bronze blade), Sierra, U.S.S. Lexington, Union Barge 1923. Windlass repairs: Point Bonito. Renew galley sheathing: tug Woodman. Renew line feed pump valve chest: tug Pilot. Caulk bulkhead rivets: Thomas P. Beal. Caulk leaky furnace front: Admiral Dewey. Boiler repairs: Francis F. Powell. Pipe repairs: Paris City Volunteer. Open main engine for examination, tug Sea Prince. Repairs to H.P. piston rod: Oskmar. Rebore H.P. and I.P. valve chambers, overhaul cargo ports: Admiral Evans, 1 tailshaft, Manoa, Capt. A. F. Lucas. Winch repairs: Point Arena. Misc. repairs: stms. City of Los Angeles, District of Columbia, La Placencia, Calawai, Montebello, Gold Shell, Covena, Emma Alexander, Standard Arrow, Corrales, Nora, Shabonee, H. W. Baxter, Dio, Admiral Evans, Willapa, Geo. L. Olson, Caspar, Willwello, Jalisco, La Perla, Point Reyes, Mongolia, Golden Eagle, Point Gorda, Point Judith, Limon, San Pedro Maru, California, Maunganui, Point Fern, San Mateo, Kenowis, m.s. Caliche, Silverlarch, Lio, Trocas, Trontolite, Canada, East Lynn, Hoyanger, Piru, tugs Sea Witch, barge Martinez, U.S.A.T. Meigs.

CHARLESTON DRY DOCK & MACHINERY CO. Charleston, S.C.

Seasonal repairs, docking, scraping, and painting: stms. Schoharin, Fluor Spar, Port Antonio.

HOWARD SHIPYARDS & DOCK CO., Jeffersonville, Ind.

Purchasing Agent: W. A. Dickey. Caulking and minor repairs: Etta Belle. THE MOORE DRY DOCK CO., Oakland, Calif.

Drydocking and repairs: stms. Dorothy Wintemote, Plume, Betterton, Warwick, barge Iroquois, car barge, tug Henry Bidle. Misc. repairs: U.S.A.T. Cambrai, m.s. Monterey, Patterson, Mt. Baker, stms. Santa Barbara, Lake Frances, Costa Rica, Westport.

PRINCE RUPERT DRYDOCK & SHIPYARD, Prince Rupert, B.C.

Docked, cleaned, painted: schr. Effie M. Morrissette (also hull and machinery repairs), C.G.S. Newington (annual overhaul) dredge Lion (misc. repairs), Big Bay Lbr. Co. scow (hull repairs), 7 fishing boats (also hull and machinery repairs). Misc. hull and machinery repairs to 28 fishing boats; 51 other commercial jobs.

TODD DRY DOCKS, INC., Seattle, Wn.

Drydock, clean, paint, stms. Cordova, Lakina, Northwestern, Cuzco (also misc. repairs). Drydock for misc. repairs: tanker Olympic. Misc. repairs: stms. Admiral Watson, Cape Cornwall, Diana Dollar, Empire Star, President Jefferson, President Lincoln, Trojanstar, Willwello.

UNITED STATES NAVY YARD, Bremerton, Wn.

Misc. repairs and docking: Tennessee. Kanawha, Farquhar, Thompson. Misc. repairs: Lexington, Saratoga. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Challenge, Pawtucket, Sotomoyo.



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Who did What - - and How

The Crowley Launch and Tugboat Company, the link between the picturesque old San Francisco waterfront and the port of today, is now operating a large fleet of Diesel-engined tugboats in bay traffic.

The Crowley fleet is powered by Diesels of various types, including Atlas-Imperial, Fairbanks - Morse and Werkspoor engines. The organization has standardized on the exclusive use of Shell lubricating oils and the operating crews are reported as ardent boosters of Shell marine products based on excellent performance records.

The steamer *Garoe't*, owned by the Rotterdamsk Lloyd and operated in the Java Pacific trade, arrived in San Francisco October the 5th for its first voyage on this coast. She left San Pedro October 27th for the Dutch East Indies via Hong Kong.

The chief engineer, W. T. Koster, has been associated with this company for more than nineteen years,

and in charge of the *Garoe't's* engines for the past year. Shell turbine oils have been used for many years in this vessel, and Chief Koster has a great deal of praise for the high quality of Shell marine products.

The officers of the round-the-world liner *President Garfield* overcame the handicap created by two days' drydocking delay in New York and the vessel left San Francisco on schedule.

The *Garfield* experienced a fire in one of her forward holds on the other coast and the dry-docking resulted. Arriving in San Francisco with the requirement of making her time out of port, a hurried call was registered for Shell marine oils, and with quick dispatch the ship was soon "bunkered" and ready for her world voyage.

Chief Engineer A. J. Higgins and First Assistant Beullis reported a good intercoastal trip with all machinery functioning perfectly. Shell

oils received a good "send-off" from these officers.

Beullis is taking a "shore-side" vacation, with First Assistant Engineer Trumbull relieving him on the *Garfield*.

While the motorship *Admiral Perry* was southward bound off Northhead on her recent voyage, sparks from the radio informed Chief Fred Jackson that an eight pound boy had been successfully "launched" for the account of the Jackson family.

Immediately more and more Shell oil was fed to the hungry motors as the gallant craft put on full speed for San Francisco.

The ship arrived about eight hours ahead of schedule!

Chief Jackson reports that the little "craft" is modelled along splendid lines, has a lusty, fog-piercing cry, and already appears to have the makings of a first-class marine engineer.



Who's Who—Afloat and Ashore

Edited by Jerry Scanlon

FOR the past several weeks Chief Engineer **John Tippen** of the McCormick lumber carrier **Wahkeena** has been shoreside on vacation awaiting the reconditioning of his vessel, which went ashore in the North Pacific. He will return as head of the propulsion department as soon as the carrier is again in commission.

It is expected that **Frank Jordan** will be assigned as chief engineer of the Dollar liner **President Johnson**, formerly the **Manchuria**, which was recently purchased from the Panama-Pacific Line for the round-the-world service.

Mr. Jordan, formerly chief aboard the **President Adams**, sailed as observation engineer when the **Manchuria** sailed on her last voyage from San Francisco to New York. First Assistant Engineer **Richard B. Pedersen** succeeds Chief Jordan on the **President Adams**.

Among the well-known members of the American Society of Marine Engineers who are recovering from various ailments after being confined to the Marine Hospital are **Frank Talbot**, **Ferdinand Rauscher**, **O. M. Dunton**, **Manley Roberts**, **William Morehouse**, and **Paul Sorenson**.

While nothing officially has been issued by the **International Mercantile Marine Company**, it is the general belief among shipping men, following many reports, that "New York" will be the name of the third electric liner that is now building for the passenger and freight service of the Panama-Pacific Line. The vessel building at the Newport News Shipbuilding & Drydock Company, is the third of her type for the company. The **Virginia** and **California** are the other two liners.

Chief Engineer **George Littleford** is again aboard the Dollar liner **President Cleveland** after four months vacation. The genial chief was greeted by more than fifty friends before the **President Cleveland** departed from San Francisco,

and his stateroom looked like a miniature floral shop.

Joe Sume, second engineer on the Panama Mail liner **Ecuador**, transferred to the same berth on the **Colombia** at New York, and when the latter vessel arrived at San Francisco, Mr. Sume left the vessel for a short vacation. He expects to return to the **Ecuador**.

Praise of the efficient manner in handling the Panama Mail liner **Ecuador** when the vessel was swept on the beach on the coast of lower California coast was extended to the deck and engine room officers by **Daulton Mann**, general manager. The **Ecuador** only remained on the sand spit for a few hours before she was floated.

"**Jimmy**" Smith is chief engineer of the **Ecuador** and is one of the most popular engine room officers in the Company's service.

Walter Gower, is now first assistant engineer on the coastwise carrier **Wilmington**. He succeeded **Ferdinand Rauscher**, who is remaining shoreside, confined to the Marine Hospital. Mr. Rauscher, is reported as doing well and expects to be around shortly.

Three gold stripes now circle the sleeves and "chief engineer" reads the insignia on the cap of **William H. Godfrey**, signifying that he is head of the propulsion department of the steamer **Charles R. McCormick**. Chief Godfrey has served on numerous of the McCormick ships and his promotion was the result of many years of faithful service. He replaced Chief Engineer **John Owre**.

George R. Nowlin, recently appointed freight traffic manager for the **Furness (Pacific) Withy & Co., Ltd.**, is now actively engaged in his new duties. Mr. Nowlin is widely-known on the Pacific Coast and his long connection with the steamship business fits him to handle his new position in a "shipshape" manner. Hundreds of friends along the Pacific Coast as well as the Atlantic seaboard, felicitated Mr. Nowlin when his appointment became known.

Fred L. Nason, general agent for the Canadian Pacific in San Francisco, states that the new liner **Empress of Japan**, building for the company's transpacific service, Vancouver to the Orient, will be in service July, 1930. Mr. Nason stat-



Six jolly British tars, officers on the **Reardon Smith** motorship **East Lynn**, which was a recent visitor to San Francisco Harbor.

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*M.S. City of S.F.	Dec.	27 Dec.	29	*S.S. El Salvador	Dec.	13 Dec.	23
*S.S. El Salvador	Jan.	3 Jan.	5	*S.S. Colombia	Dec.	24	
*S.S. Colombia	Jan.	17 Jan.	19				

†Ports of call—Mazatlan, Manzanillo, Champerico, San Jose de Guatemala, Acajutla, La Libertad, La Union, Amapala, Corinto, San Juan del Sur, Puntarenas, Balboa and Cristobal.

*Ports of call—Mazatlan, Champerico, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Puerto Colombia, Havana (Eastbound only), Cartagena (Westbound only), and New York.

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ed that the vessel will be of 26,000 gross tons register, 662 feet long at the water line; 83 feet beam; and will draw a maximum of 30 feet. She will have a speed of 21 knots and will be the largest liner in the Canadian Pacific service and the largest in regular service on the Pacific Ocean.

Officials of the Blue Star Line will present suitable honors to Second Engineer **Sidney P. Houstos** and Fireman **James** of the Trojanstar, for their heroic action in saving five other men of the vessel's engine room when fire broke out off the California Coast while the Trojanstar was enroute to Vancouver.

Winners of honors by various ships and officers in the service of the **Luckenbach Steamship Line** have been announced. The **Lewis Luckenbach**, Captain **A. H. Sears**, named after a member of the noted steamship house, wins the gold "A" on her stack, indicating she is the winner of the competition among carriers of her class in the fleet for efficient operation, personnel appearance, and freedom from stranding and docking mishap.

For the purpose of competition, **Lewis Luckenbach**, vice-president, divided the fleet into three classes—A, B, and C, and a substantial cash prize was offered for the master, chief engineer, and all licensed officers to encourage the greatest amount of efficiency possible throughout the fleet.

The **Harry Luckenbach**, Captain **R. McKinnon**, has been chosen as the winner in B group and will have a gold "B" painted on her stack.

The **Edward Luckenbach**, Captain **L. S. Jellison**, is the winner in class C and will carry a gold C on her stack for the ensuing year.

Judges of the contest are: **Lewis Luckenbach**, vice-president; **M. J. Wright**, Pacific Coast manager; **E. Holzborn**, district manager, Mobile; **Walter Greene**, superintending engineer, Brooklyn; **J. A. Gibson**, general claim agent, New York; **W. G. Perow**, Pacific Coast marine superintendent; and **H. M. Singleton**, general marine superintendent, Brooklyn.

The appointment of **James H. Todd, Jr.**, assistant general freight agent of the **Sudden & Christenson Company**, San Francisco, as lecturer in Ocean Shipping Practice



Captain George V. Richardson, master of the Panama Pacific steamship *Mongolia*, who is said to be slated for one of the new electric liners.

for the University of California Extension Division, has been announced. The course includes a series of ten lectures.

The **Matson liner Malolo** will be laid up during the present month to permit of her annual coating of paint and general dry-dock work, **Matson officials** declared. Alterations and minor changes will be undertaken in some of the service departments on board the vessel. These will include removal of the ship's beauty parlor and barber shop from "F" to "D" deck.



George Dow, recently appointed Chief Officer of the Panama Mail liner *Colombia*, said to be the youngest officer of this rank in that company's service.

The steamer **Lurline** will enter the Alaskan waters next spring bearing the name of **Chirikof**, according to her new owners, the **Alaska Packers' Association**. Permission to change the name of the steamer for the salmon fisheries was approved by the Commissioner of Navigation at Washington. The **Lurline** formerly operated for the **Matson Line**.

Reorganization of the **Gulf-Pacific Conference**, perfected at New Orleans is expected to do much toward stabilizing rates, according to San Francisco shipping officials. Conditions in the Gulf trade were considerably upset by the withdrawal of the **Redwood Line** from the conference. It is now understood that the four lines engaged in the trade have subscribed to the rate agreement in that section.

Captain **William J. Kelton**, port pilot for the **American-Hawaiian Steamship Company** at Los Angeles harbor, has been promoted to port superintendent of the line at that port. Announcement of the promotion was made in San Francisco by **Thomas G. Plant**, operating manager of the company. The position was newly created and was necessitated by increased business. **Plant** declared.

The **Inter-Island Steam Navigation Company** has awarded \$3,500,000 in contracts to the **Bethlehem Shipbuilding Corporation** of San Francisco during the past year. These figures include the cost of four vessels—construction of the passenger liner **Waialeale**, amounting to approximately a million and a half dollars, another passenger liner under construction, a tug to cost \$250,000, and a pineapple barge.

Word has been received that the **Oceanic Terminals Company** at Portland will build two additional piers to its new terminal there, adding complete facilities for the handling of river traffic as well as deep sea tonnage. The company will add, also, to the capacity of its warehouse.

The **French Line** is planning a second vessel of the type of the **Ile de France**, according to announcement made in New York by **Felix Lachesnez-Heude**, associate passenger traffic manager of the

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line. He also reported that the line will launch a vessel of the De Grasse type next spring. The latter vessel will be added to the Havre-New York service the following year.

Advices received here from New York declare that the Grace interests have let contract for construction of an 18-knot passenger and cargo carrier to the New York Shipbuilding Company. Plans call for a vessel of the general type of the Santa Maria. This vessel will be added to the Grace service in accordance with requirements of the company's government mail contract.

Marius Boeger, vice-chairman and director of the Hamburg-American Line, and his son and wife, made a tour of inspection of shipping facilities in the San Francisco Bay region. The noted shipping man was well received at all shipping points on the route of his tour of the line's offices and expressed amazement at the growth of business in this country.

Frank Littlefield, chief engineer of the liner President Cleveland, has rejoined his ship after a sojourn of four months shoreside. His place on the vessel was taken by the first assistant engineer, K. C. Stubbs.

Captain George R. Metcalfe, commander of the White Star liner Majestic and commodore of the fleet, who has been absent from his post for many weeks due to ill-health, will not resume sea service, according to a cable received by the San Francisco offices of the company. Captain Metcalfe has been given extended leave until he reaches the retirement age at the end of 1930. Captain William Marshall, C.B.D.S.O., succeeds to the command of the Majestic.

Chalmers Graham and **John Levison** of the harbor and maritime committee of the San Francisco Junior Chamber of Commerce in a report to their organization advocate the construction of a San Francisco waterfront terminal to provide adequate space for canned and dried fruits, and also space for a naval supply depot. The terminal should be constructed in connection with the proposed two million dollar fresh fruit cold storage terminal now being studied by port authorities, the report says.



Joseph J. Tynan, vice-president and general manager, Union Plant, Bethlehem Shipbuilding Corporation.

H. F. Alexander has confirmed report of the purchase of the American transatlantic liner Mount Clay by the Pacific Steamship Company for the coastwise service. Passenger quarters are to be entirely rebuilt and plans for reconstruction are being drawn up. Shipyards on both coasts will be asked to submit bids for the work. The vessel will be placed in service on the Pacific Coast next summer.

Officers reelected at the annual meeting of the Pacific Steamship Company were: **H. F. Alexander**, president; **R. Stanley Dollar**, first vice-president; **Herbert Fleishhacker**, vice-president; **A. F. Haines**, vice-president; **E. A. Stuart**, vice-president; **E. H. Hall**, treasurer and comptroller; **J. H. Cooper**, secretary.



Sven Soderblom, passenger manager for the General Steamship Corporation.

Dr. E. L. Overholzer, assistant professor of pomology on the University of California farm at Davis, may soon start on a voyage across the Pacific on a unique mission to study further the question of refrigeration as applied to the transportation of fresh fruits. He will be accompanied by a staff of experts. Professor Overholzer is an expert on fruit refrigeration and has made deep studies of this subject abroad.

Offices of the **Redwood Line**, which operates between San Francisco and Gulf ports, will soon be established in San Francisco, it is announced by **Theodore Brent**, president and general manager of the company. Ever since this service started, McCormick Steamship Company has acted as agent for the company and will continue in this capacity until the early part of December as far as eastbound cargo is concerned. **E. Olmstead**, who has been in charge of the lumber plant at Rockport will take charge of the offices in San Francisco.

Before the Foreign Trade Club of California, **Norman F. Titus**, chief of the transportation division, U. S. Department of Commerce, declared that the United States would never be successful in attaining a great merchant marine unless all interests having to do with shipping get together and organize along lines similar to Great Britain, which has maintained its "Chamber of Shipping" for the past fifty years. That all interests associated with water transportation should perfect an organization has been advocated by Titus both here and in New York.

Collector of Customs **Hamilton** at San Francisco announces that authority has been received from the Commissioner of Navigation to change the name of the liner Manchuria to President Johnson. The steamer was recently purchased by Robert Dollar.

Pacific Coast organization and the Foreign Trade Club of the San Francisco Chamber of Commerce are considering recommendations of **Major Charles L. Tilden**, president of the California Board of State Harbor Commissioners, for establishment of a "free port" at San Francisco. In an address before the Foreign Trade Club Tilden elucidated reasons why a free port

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would be a real relief to agriculture.

While on a tour of the Pacific Coast, **M. C. O'Hearn** of New York, vice-president in charge of operation for the United Fruit Company on this coast, **W. B. Wheeler**, general passenger agent of the "Great White Fleet," and **Lester W. Minchin**, manager of the company in Boston, were enthusiastic over the expansion of their interests to this coast a year and a half ago. The United Fruit Company entered the Pacific Coast trade with a fleet of smaller ships in the transit of bananas from Port Limon, Costa Rica, to San Francisco. This was considered a great commercial event. Replacing of the smaller ships by those of larger type is now being considered by the company. O'Hearn declared. Predicting further ship service through the Panama Canal to San Francisco, O'Hearn pointed out that this was contingent upon the development of an immense tract of land recently taken over by the United Fruit Company in northwestern Panama, on the West Coast, known as the Chirique project. This, he said, will be one of the major projects of the United Fruit Company in Central America.

Government and local shipping officials mourned the passing of **Captain D. R. Fleming**, in San Francisco last month. The well known master mariner sailed through the Golden Gate for more than thirty years and his wide maritime experi-

ence took him into many ports of the world. During the war he entered service and was subsequently transferred to the transport *Lancaster*. He was commander of the *Nanking*

under the China Mail flag and was master of that vessel on its last entry at San Francisco. He is survived by a widow, Mrs. Eleanore Fleming, and a son Ralph.



From a photograph taken in 1905 at Ukiah:
Left: Frank Bond, head of C. G. Clinch & Co., agents for International Compositions Company.

Center: Harry McGimpsey, owner of the ranch at Ukiah.
Right: W. C. Empey, publisher of "Guide" at San Francisco.
Frank shot both deer. No trouble killing a buck when you are hiding behind the "brush."



Roger Lapham, president of the American-Hawaiian Steamship Company, is a connoisseur of ship modeling. Here are a few samples from his beautiful collection.

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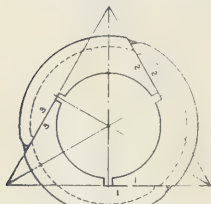
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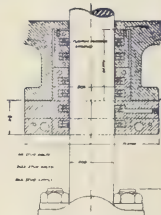
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

OF PACIFIC MARINE REVIEW, published in monthly at San Francisco, California, for October 1, 1925
State of California)
County of San Francisco) ss.

Before me, a Notary in and for the State and County aforesaid, personally appeared Bernard N. DeRoche, who, having been duly sworn according to law, deposes and says that he is the business manager of the Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the name and address of the publisher, editor, managing editor, and business managers are:
Publisher—Jas S Hines, 151 Tunnel Road, Berkeley, California

Editor—A J Dickie, 1636 Matiposa Avenue, Berkeley, California

Managing Editor—None.

Business Manager—B N DeRoche, 737 Contra Costa Ave., Berkeley, California.

2. That the owner is (If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Jas S Hines, owner.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stock-

holders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee, or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona-fide owner; and that this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

BERNARD N. DEROCHE

(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed before me this 25th day of September, 1925.

(SEAL)

EDITH M. CLARK,

(My commission expires April 22, 1932.)

Trade, Traffic, and Shipping

(Section continued from Page 545)

American Port Experts to Investigate European Ports

CONSTITUTING perhaps the most representative group of American inland waterway and port men to visit Europe, the Ocean and Inland Harbor Inspection Tour of Europe will sail on April 20, 1929, for an official and detailed visit to European points of direct technical interest.

Headed by Dr. R. S. MacElwee, Director of the Bureau of Port Development, Charleston, South Carolina, the group has two principal purposes in view. One is to advertise in Europe to the greatest possible advantage the various American ocean and inland ports. Second, the visit has been so arranged that it will be completely devoted to the most thorough technical inspection of the major European developments in this field.

On the Committee for the group are Dr. R. S. MacElwee, chairman, S. A. Thompson, secretary of the National Rivers and Harbors Congress; Major Daniel I. Sultan, resident member of the Board of Engineers for Rivers and Harbors; J. Spencer Smith of New York; C. H. Newman, secretary of the Society of Terminal Engineers; George F. Nicholson, harbor engineer, Board of Harbor Commissioners, Los Angeles; and Major L. R. Lohr, editor of the Military Engineer.

A total of seven weeks will be consumed by this visit, from New York to New York. Landing at Liverpool, five days will be divided between that great port, Manchester, Hull, and important transport development at the Port of Goole, near Hull. Coming on down to London, six full days of thorough study under guidance of British authorities will be spent, visiting all of the points of special interest; proceeding thence to Rotterdam and Amsterdam, where further inspection arrangements have been made.

After that will follow interesting inspections at Bremen, Hamburg, Lubek, Kiel, Berlin, Stettin, and then on down to the great inland waterways of the Ruhr country, including Dusseldorf, Duisburg, and

Cologne. Belgium follows, with Antwerp and Brussels, proceeding then by motor to Calais, Boulogne, and Paris. After four days in Paris, the delegation departs for a day at Havre, where they take a ship for home.

Everything possible is being done to insure the official character of the delegation and to see that the most effective receptions and facilities are placed at their disposal. Close contact is being kept with European waterways and harbors bodies with regard to the group,

and it is apparent that this will be one of the most practical means of bringing American port interests to the attention of Europe. Through this visit, it is believed, the members of the group will be able to see clearly the progress of European developments in these fields and to observe to the best advantage the comparison with our own accomplishments along this line.

Those desiring further information regarding the visit are requested to get in touch with Dr. MacElwee, at 92 East Bay, Charleston, South Carolina, or with Edw. G. Eichelberger, travel director of the group, at Suite 622, 551 Fifth Avenue, New York City.

An Optimistic Shipping Outlook

UPON the recent return of Charles L. Wheeler, vice-president and general manager of the McCormick Steamship Company, to his San Francisco headquarters after an extended trip East, where he attended the Intercoastal Conference meetings and conducted negotiations with the Post Office Department and the United States Shipping Board in connection with the McCormick Company's Pacific Argentine Brazil Line, he announced that this line has been certified to by both the Postmaster General and the Shipping Board as a mail route, and bids are to be received by the Postmaster General for this service during the current month.

Arrangements were also made with the Postmaster General and the Shipping Board for further improving the service of the Pacific Argentine Brazil Line with special reference to providing refrigeration service, improved passenger accommodations, and a readjustment of ports of call to provide the best possible mail service, as a great volume of second, third, fourth class, and parcel post mail will be handled by this line.

Mr. Wheeler stated that the Shipping Board is taking a very keen interest in supporting lines

that the government has sold and is taking steps to provide all the support with which they are empowered under the Shipping Act and the recent Jones-White legislation toward building up the American merchant marine.

Mr. Wheeler is very optimistic concerning the future prosperity of the Pacific Coast. He said, "Few people on the Coast realize the tremendous value to the Pacific Coast of its exports. This year, exports of Pacific Coast products have increased by hundreds of thousands of dollars. This naturally means a much greater buying power, and it is one of the basic reasons for our increased trade, coastwise, intercoastal, and offshore.

"Throughout the East, one finds travelers more interested than ever before in visiting California. It is predicted by tourist agencies that during the coming year California will have by far the greatest influx of visitors in its history.

"Mr. Thackara has the major problems of the Intercoastal Conference well in hand, but there are made to satisfy the individual lines. Still some minor adjustments to be Chairman Thackara and the committee chairmen were working on these matters when I left New York,



A Frond of Fern Twenty Feet High

THE magnificent highway that leads from Hilo to Hawaii National Park crosses the great Tree Fern forest on the slope of snow-capped Mauna Loa. Here is a jungle of gigantic ferns, and trees with leaves as big as umbrellas. Beyond are the other marvels of the park: the lava tubes, the dormant craters, and the incomparable spectacle of Kilauea itself.

Nowhere else are the marvels of nature so accessible as in Hawaii; and surely nowhere else is there such variety. The fast, commodious ships of the Matson Line will carry you there. The new Malolo has established a standard of luxury and smartness on the Pacific, unsurpassed on any sea. There are one or more Matson Liners from San Francisco to Honolulu every week, including the Malolo on alternate Saturdays, on and after December 29. Inclusive 21-day tours, \$286 up; 25-day tour, S.S. Malolo there and back, \$428 up.

Australia

Express passenger service, 19 days, via Hawaii, Samoa and Fiji.

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and it is my opinion that the first of the year will see these worked

out and a sound foundation laid for a prosperous 1929."

Pacific Port Notes

Tacoma will have a \$2,000,000 cold storage plant, if plans of the Pierce County Port Commission are allowed to be included in the 1929 budget.

Atlantic Gulf & Pacific Co., New York, was low bidder on the work of dredging the first section of the new south channel at Port Newark, New Jersey, quoting \$621,000. Next lowest bid was by W. H. Gahagan, Inc., Brooklyn, \$675,000.

New Westminster, British Columbia, will shortly see the start of extensive port developments with the construction of a terminal comprising cold storage plant, warehouse and docks, to cost \$2,125,000. The Pacific Coast Terminal, Ltd., has been organized to build this terminal, members being Sir Henry Thornton, J. J. Warren, A. Melville Dollar, B. W. Greer, C. E. Disher and other Vancouver shipping men.

San Diego. It is reported that certain San Francisco interests are planning construction of twin tubes beneath San Diego Bay to connect that city with Coronado. The engineering firm of Francis B. Smith is interested.

Benicia, Calif. The Southern Pacific Company plans the construction of a high level bridge across Suisun Bay, an arm of San Francisco Bay, connecting Benicia and Port Costa. This is the route taken by the company's overland trains from San Francisco, and the railroad company now uses ferryboats to transport passenger trains across this body of water. The estimated cost of the project is \$10,000,000.

San Francisco. McDonald & Kahn, San Francisco contractors, have been awarded contract for erection of four steel sheds on Pier 45 at a cost of \$229,900. Pier 45 is to be San Francisco's largest pier, and is to cost about \$2,000,000. It was recently damaged by fire which will entail an extra expense of about \$100,000.

Oakland. The City of Alameda has withdrawn its objection to the dumping of dredgings from the Oakland inner harbor on its western tidelands. This objection has held up the work of government dredging in Oakland inner harbor, which, it is reported, will now be undertaken in conformity with appropriations made to the War Department.

Redwood City. Plans are being made to develop the harbor on San Francisco Bay. City Engineer is C. L. Dimmitt. Preliminary plans cover construction of wharf, warehouse, spur track, roadway, and reclamation of land, at cost of \$102,900.

Portland, Oregon. The Texas Company is building a dock and oil distributing terminal. Gilpin Construction Company has contract for the dock, to cost \$20,000. The total cost of the marine terminal is said to approximate \$750,000.

Tacoma, Wash. Tacoma Dredging Co. was awarded contract for dredg-

ing an area of 270,000 square feet in the vicinity of Pier No. 6 at the Navy Yard, Bremerton, on a bid of \$83,420.

Seattle. The Richfield Oil Company is planning the establishment of an extensive marine terminal at Smith Cove. Tanks of 125,000 barrels capacity for fuel oil and one of 85,000 barrels capacity for gasoline will be added to the company's present facilities. In addition, office building, pump house, Foamite fire extinguishing plant will be added. The estimated investment is \$1,500,000.

Balboa, Canal Zone. Repairs on the Panama Canal locks costing \$500,000 have been approved and work of overhauling will start the first of next year.

Freight, Charters, Sales

November 16, 1928.

THE following steamers are reported fixed with grain from the North Pacific to the U. K. Continent: a Cort steamer, B. C. to Lisbon 30/, opt. Medit. 30/6, Nov/Dec., Wm. H. Pim, Jr.; British str. Buchanness, Portland or Puget Sound to U. K.-Cont. 30/9, Nov/Dec., same charterers; a Ropner str., Vancouver to Antwerp or Rotterdam, 29/-, Dec., Earle Stoddard & Clayton; a Ruciman str., Vancouver to Rotterdam, 29/-, Dec., same charterers; British str. Innerton, Vancouver to Mediterranean, Dec., Canadian Cooperative Wheat Producers; British str. Wearpool, Vancouver to U. K.-Cont., Nov., same charterers; British str. Blythmoor, Vancouver to Rotterdam, 29/-, Dec., Earle Stoddard & Clayton; a Halding str., Vancouver to Lisbon, 30/-, Dec., Wm. H. Pim, Jr.; a Ropner str., Vancouver to Antwerp or Rotterdam, 29/-, Jan., same charterers; a Ropner str., same, Feb.; a Ropner str., same, Mar.; Japanese str. . . Maru, Vancouver to U. K.-Cont., 28/9, opt. Puget Sound/Portland, 30/-, with Scandinavian options, Nov.; British str. Kirkpool, North Pacific to U. K.-Cont., 29/-, Dec., W. L. Comyn & Co.; Japanese str., Vancouver to Lisbon, 31/6, opt. discharge Mediterranean 32/-, option loading Puget Sound or Portland 1/3 extra, Dec., Wm. H. Pim, Jr.; a str., Vancouver to Antwerp or Rotterdam, 29/6, Jan., Heatley & Co.; Japanese str., Vancouver to Lisbon, 31/9, L. Dreyfus & Co.; a King str., Vancouver to Antwerp

or Rotterdam, 29/-, Dec., Heatley & Co.; Dutch str. Maasburg, Vancouver to Antwerp or Rotterdam, 29/-, Jan., Earle Stoddard & Clayton; a Smith str., same, 29/6, Dec., J. W. Mitchell; a Ropner str., same, 29/3, Jan/Feb., Can. American Shipping Co.; British str. Koranton, same, 29/-, Dec., Heatley & Co.; Dutch str. Flensburg, same, 29/6, Jan., Canadian American Shipping Co.; Dutch str. Vredenburg, same, 29/8, Hamburg, 30/3, Jan.; A Ropner str., Vancouver to U. K.-Cont., 29/-, if Antwerp or Rotterdam, 28/6, Jan.; a str., Vancouver to Lisbon, 31/6, Portland or Puget Sound loading, 32/9, Dec.; a Smith str., Vancouver to Antwerp or Rotterdam, 29/6, Dec., Canadian American Shipping Co.; a Japanese str., same, 29/6, Feb.; British str. Clearton, Portland to U. K. - Cont. (relet), Oct/Nov., L. Dreyfus & Co.; Japanese str. Yone Maru, Vancouver to Lisbon, 30/-, Dec.; British str. Pearlmoor, Portland to U. K.-Cont., 31/-, Nov/Dec., Kerr Gifford & Co.; a steamer, Vancouver to Antwerp or Rotterdam, 29/-; option Hamburg or Bremen 29/6, option Prince Rupert, Portland or Puget Sound loadings, Jan.; a str., same, Feb.; a str., same, Mar.; a str., Vancouver to U. K.-Cont., 30/-, if Portland/Puget Sound loading 1/3 extra, Dec.; a Ropner str., Vancouver to Antwerp/Rotterdam, 29/-, -/9 extra to both ports, Dec.; Swedish M. S. Oxelosund, Portland or Puget Sound to U. K.-Cont., 33/3, option B. C. loading 1/3 less, option discharge Ireland -/6 ex., Jan., Strauss

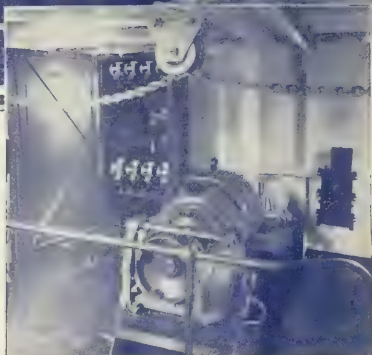


"Diesel Trawler"
BOSTON COLLEGE

A. & P. Fisheries Co.
 Boston, Mass.



DIEHL Electrical Equipment, designed especially for fishing boats, is of unusually sturdy construction, with particular attention given to the quality and adequacy of insulation enabling the equipment to withstand the exceptionally severe service to which fishing boats are subjected.



DIEHL TRAWL WINCH MOTOR

*Equipped with Cutler-Hammer Watertight Brakes,
 Master Controller and Contactor Panel.*

The "BOSTON COLLEGE" is the first of three Diesel engine trawlers using Diehl electrical equipment ordered by the A. & P. Fisheries Company, Boston, Mass., from the Bath Iron Works, Bath, Maine.

The electrical equipment supplied by the Diehl Manufacturing Company includes:

Diehl Type TH, 75 H.P. heavy duty trawl winch motor, capable of delivering 150 H.P. for short periods.

Diehl Type L-16, 10 K.W. drip-proof ball bearing marine generator for connection to auxiliary Diesel engine for lighting, battery charging and pump motor operation.

Diehl small marine type motors.

Cutler-Hammer watertight 14" electric brake; master controller with bevel gear drive extended through bulkhead for operation from the forecastle; enclosed contactor panel for automatic trawl winch control; marine type grid resistance.

DIEHL MANUFACTURING COMPANY

Electrical Division of THE SINGER MANUFACTURING CO.
 ELIZABETHPORT, N.J.

& Co.; Japanese str. Thames Maru, Portland to U. K.-Cont., 30/-, Nov., Kerr Gifford & Co.; British str. Warkworth, Vancouver to Lisbon, 34/-, Dec/Jan.; L. Dreyfus & Co.; British str. King . . . Vancouver to U. K.-Cont., 30/-; Japanese str. . . Maru, Vancouver to Lisbon and/or Leixoes, 31/9 one port, 33/- two ports, Jan.; a str., Vancouver to Antwerp or Rotterdam, 29/3, Jan/Feb.; a Smith str., Vancouver to Antwerp and/or Rotterdam 29/6 one port, 33/- two ports, Dec.; a Smith str., Vancouver to Antwerp or Rotterdam, 29/6 one port, 33/- two ports, Dec.; option Hamburg 30/6, Dec.; Japanese str. . . Maru, Vancouver to Antwerp and/or Rotterdam, 29/6 one port, 30/6 two ports, option Hamburg 30/3, Feb.; Japanese M. S. Taijin Maru, North Pacific to Antwerp, Dec., J. J. Moore & Co.; Swedish M. S. Nuolja, Vancouver to Antwerp/Rotterdam or Hamburg 30/6, option U. K./Bordeaux-Hamburg, 31/-, Jan.; a British str., Vancouver to U. K./Bordeaux-Hamburg, 31/-, option Antwerp or Rotterdam 30/-, Dec/Jan.; two strs., Vancouver to Antwerp or Rotterdam, 29/6, Feb.; A Ropner str., Vancouver to Antwerp/Rotterdam, 29/3, Jan/Feb.; British str. York City, Vancouver to Antwerp/Rotterdam, 29/6 one port, 30/6 two ports, Nov.; British str. Bradfyne, Vancouver to U. K.-Cont., 32/9, Jan., Eggar Forester & Parke; British str. Langelford, Vancouver to U. K.-Cont., 33/-, Dec/Jan., J. W. Mitchell, Ltd.; British str. Fernmoor, British Columbia to U. K.-Cont., 33/6, Jan., Canadian Coop. Wheat Producers, Ltd.; British str. Vera Radcliffe, Vancouver to U. K.-Cont., 32/6, Dec., L. Dreyfus & Co.

The following fixtures for grain from Vancouver to the Orient are reported: British str. Shakespear, Calcutta, 29/-, Dec., L. Dreyfus & Co.; a Weir str., Calcutta, 30/- in bags, 29/- in bulk, Oct/Nov.; Japanese str. Ryoka Maru, Shanghai, Nov.

The British M. S. Jedmoor is reported fixed from Columbia River with lumber for Australia, Nov. loading, by J. J. Moore & Co., and the Norwegian M. S. Beljeanne from Humboldt Bay and Columbia River to Australia, same charterers.

The following lumber fixtures to the Orient are reported: Japanese str. Toyokawa Maru, Puget Sound to Japan, Nov., Mitsui & Co.; Japanese str. Milan Maru, North Pacific to Japan, Nov., Yamacho &

Co.; British M. S. Swanley, Columbia River to two ports China, Oct/Nov., Dant & Russell; Japanese str. Junyo Maru, Puget Sound to Japan, wheat and lumber, Nov., Mitsui & Co.; Japanese str. Ishin Maru, North Pacific to Japan, lump sum \$35,000, Nov.; Japanese str. Rozan Maru, same, Dec. (no rate reported), Yamacho & Co.; Japanese str. Yayoi Maru, same, Jan, Yamacho & Co.

The American str. Maltram is reported fixed with lumber from the North Pacific to New York, at \$13, Oct. loading, by R. R. Sizer & Co., and the American str. San Pedro from Tillamook and Puget Sound to New York, prompt loading, by Hammond Lumber Co.

The Italian M. S. Ansaldo San Giorgio Torzo is reported fixed from the North Pacific to Antwerp with merchandise, Dec. load-

ing, by W. L. Comyn & Co.; Norwegian str. Hampholm, Puget Sound to U. K.-Cont., wheat and mdse., Dec., same charterers, and Italian M. S. Probitis, North Pacific to U. K.-Cont., mdse., Dec., same charterers.

The following time charters are reported: Japanese str. Kohnan Maru, Pacific trade, 6 mos., Yen 1.90, Oct., Ocean Transport Co.; Japanese str. Tonegawa, Pacific trade, 6½ mos, Yen 1.85, Oct., same charterers; British str. Anglo-Indian, Tacoma to Sydney, \$1.42½, Dec.; Swedish M. S. Erik Frisell, Pacific trade, 3 months, delivery Hampton Roads, redelivery Japan/China, \$1.30, Nov/Dec.; British str. Quercus, delivery Shanghai, Nov.; redelivery; River Platte via Columbia River, \$1.15, H. R. MacMillan Export Co.

PAGE BROTHERS,
Brokers.

Additional Refrigerator Space For Pacific Fresh Fruits

TWO additional "Silver" ships will be equipped with refrigeration facilities to add to existing space provided by the Kerr Line service from San Francisco to Yokohama, Kobe, Shanghai, Manila, Java, and Singapore, according to recent announcement from the offices of the General Steamship Corporation, Pacific Coast agents. The vessels to be so equipped are the Silverash and the Silverbeech, and they will each have available 40,000 cubic feet, sufficient to lift approximately 800 measurement tons of perishable cargoes.

This line was inaugurated a year ago with the four new motorships Silverguava, Silvermaple, Silverbelle, and Silverhazel to provide for the growing trade to the Orient in Pacific Coast fresh fruits. With the installation of the additional facilities a more regular schedule will be possible. Under this plan there will be a sailing from San Francisco every 23 days.

"Again the Kerr Line has taken a forward step in offering shippers of fresh fruit additional space to enable them to expand their sales in the Far East," says H. S. Scott, president of the General Steamship Corporation. "While we have no definite information as yet as to just when the vessels thus equipped will come on berth, we are sure

that they will be ready for the next season."

Fresh Water Cities Foreign Trade Minded

THE old notion that only cities on salt water are interested in foreign trade is found by the Foreign Commerce Department of the Chamber of Commerce of the United States to be obsolete. From this viewpoint the hinterland in the United States is fast disappearing. The Department points to the fact that sixty-nine chambers of commerce now maintain foreign trade bureaus, and the number is on the increase. A number of these are in fresh water cities, many of them hundreds of miles from the seaboard.

Akron, Atlanta, Chattanooga, Des Moines, Evansville and Fort Wayne, Ind.; Keokuk, Iowa; Omaha, Spokane, Wichita are looking beyond the shore line toward foreign markets, not to speak of the large interior industrial centers, such as Chicago, St. Louis, and Kansas City.



Some Users of
LIGHTHOUSE
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American Hawaiian S.S. Co.
Associated Oil Company
Baltimore Shipbuilding & Drydock Co.
California Petroleum Corp.
California Transportation Co.
Ch. N. Jones & Sons
Dollar S. S. Company
General Engineering Company
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Hanson Shipbuilding & Drydock Company
Marine Navigator Company
McCormick S.S. Company
Santa F. R. R. Company
Standard Oil Company, Calif.



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BITURINE?

METAL PRIMERS

--A Brief Discussion of that Important Factor of Protection

WHY A METAL PRIMER

A metal primer performs two important functions. It protects against corrosion and affords a good base upon which to apply succeeding coatings. If it does not meet these two requirements, it is not a correct primer.

WHAT KIND OF A PRIMER

To be effective, a metal primer must have four distinct characteristics.

- 1—It must be finely ground to insure close adhesion to the metal it is to protect.
- 2—It must be composed largely of nonconductive basic metal inhibitive pigments.
- 3—It must have a correctly formulated vehicle to insure a perfect inhibitive film. One of the best vehicles is a combination of Linseed Oil, China Wood Oil and other special oils and driers properly heat treated.
- 4—It must dry nearly flat to present the proper "tooth" so that the finish coat can bond properly.

Years of tests have proven that the "Factory built" primer affords longer life and more protection than the "Mixed on the job" primer.

TWO-FIFTY IRON PRIMER

is formulated according to the latest theories of Inhibitive primers. It is made from known Inhibitive pigments. The liquid vehicle is Inhibitive in character, and is made of a heat treated combination of China Wood Oil, Linseed Oil and Hard Fossil Gums.

207 RED LEAD PRIMER

is the perfected Red Lead Primer, ready mixed. It is finely ground and made to the United States Navy formula.

LIGHTHOUSE WHITE ZINC PRIMER

is a white zinc primer of the highest grade, made of finest Zinc Pigments and ground in a special heat treated Inhibitive vehicle.

Hill, Hubbell & Company

Manufacturers of

Lighthouse Brand Marine Paints and Varnishes
Biturine Enamel

LOS ANGELES
PORTLAND
NEW YORK

SAN FRANCISCO
The Marine Engineering & Supply Co.
Wilmington, California

SEATTLE
HOUSTON
TULSA

The Reardon Smith Line

(Continued from Page 543)

two are abaft. The dimensions are 22-inch bore by 2 by 42½ inches stroke; the rating at 82 revolutions a minute is 2450 brake horsepower. The engines maneuver under a slow bell with regular firing at 19 revolutions a minute.

Particulars of Hull Machinery
Length between perpendiculars 400'0"
Breadth 54'3"
Depth of hold 24'0"
Net tonnage 2845.25
Class, British Corporation, Highest
Fuel capacity (total including double bottom, peaks, and deep tank), tons 1793
Lubricating oil, gallons 2100
Engines: Doxford patented opposed piston marine oil engine; airless injection type; 4 cylinders; 560 mm. bore x 2 x 1080 mm. stroke. Donkey boiler: Cochran boiler; 46" dia. x 11'6" high.

Oil burning system: Kermode, single unit system.
Boiler feed pump: Weir.
Evaporator: Weir.
Auxiliary condenser: Davy and Horne.
Electric generators: Mirlees, Bickerton and Day.
Windlass: Clarke Chapman, electric.
Steering gear: Donkin, electric.
Winches: Sunderland Force, electric.

T. A. Lee and Holway, San Francisco, are general Pacific Coast agents for the Reardon Smith Line's Pacific Coast-United Kingdom service. Intercoast Steamship Corporation is representative in Seattle; McCormick Steamship Company is agent at Portland; and the Los Angeles Steamship Company takes care of shipments from Los Angeles harbor.

The Union Gas Engine Company

(Continued from Page 533)

in capacities from 27 to 400 horsepower. Union diesels are now used by the United States, the French, and the Canadian governments. These engines are in operation both afloat and ashore in all the Pacific Coast states, in Florida, on

the Mississippi, in Mexico, in the South Pacific islands, and in many countries bordering the Pacific.

The good name of "Union" has now attached itself exclusively to engines of the full diesel type.

The California Tuna Fleet

(Continued from Page 538)

payable in eight equal quarterly installments, which gives the purchaser two years to complete payments. The cannery guarantees the contract.

The packer borrows the money to build the boat and takes a first mortgage on the vessel to secure his interest. Sometimes the boat builder advances the necessary construction funds and sells the engine, in which case he holds both contract and mortgage. In lieu of wages, tuna boat operators are paid on a share basis, each man receiving an equal share in the net proceeds of all cruises, after the cost of supplies and the boat's share have been deducted. The vessel's share generally is about one-third. Profits are apportioned quarterly. For example: At the end of every three months the net profits of a 10-man boat are divided into 15 equal portions, of which each man receives one share. The remaining five shares are turned over to the

owner, or used to meet engine and hull payments.

The principal problem now confronting the tuna industry is to find adequate supply of fish. The habits of this fish, which belongs to the mackerel tribe, are not well known; but the number of specimens taken in southern California waters has steadily decreased. The Turtle Bay banks, 400 miles south of San Diego, have yielded a heavy tonnage few years, but new banks must be found to maintain the supply. In order to conserve the future supply of tuna and also to avoid the extra labor of handling small fish, packers have agreed not to accept skipjack under 6 pounds and other kinds of tuna below 10 pounds.

Allaire Bank, located where the 120 meridian crosses the 20 parallel of latitude, hundreds of miles west of the tip of Lower California, is to be explored in January by some of the larger tuna boats. This bank lies under 70 fathoms of water

and was discovered by rum runners, for whom it provided safe anchorage and a position easily located.

Socorro Bank, 1400 miles south of San Diego, was discovered by Guy Silva and also will be visited by California fishermen this season. How much farther south tuna exist in commercial quantities no one knows. The distance which boats can profitably transport fresh fish to canneries, however, is limited. Factory ships, similar to those used for processing whales, may be used by tuna packers, but it is difficult for such vessels to operate off the Lower California coast, as there is no adequate water supply south of Ensenada, which is less than a hundred miles south of San Diego.

San Pedro's fish canning industry is one of the largest in the world. \$6,500,000 worth of tuna and \$3-, \$50,000 worth of sardines were packed last year. Skipjack and yellowfin were the principal varieties taken the past season, 14,000 tons of the former and 13,000 tons of the latter being delivered to southern California canneries.

San Diego also has extensive tuna canneries, and a few are located at Wilmington and Long Beach. Van Camp is the world's largest fish packer, having canned a million cases of tuna and sardines last year, half of each. This concern has \$3,000,000 invested in five canneries and owns over \$1,000,000 worth of boats, of which \$400,000 was spent in new construction this year. The Van Camp fleet includes 33 large vessels, of which the 115-foot Adventurer, recently completed by John Rados, is the newest addition.

Trade Note

R. W. Turnbull, manager of the Pacific Coast District of the **Edison Electric Appliance Company**, has announced that the Pacific Coast district sales office of the company is now located at 126 New Montgomery Street, in the Rialto Building, San Francisco. The factory branch service station will also be located at this address. With these improved facilities, the Edison Electric Appliance Company will now be equipped to promptly handle all service problems on electric appliances, ranges, hotel, restaurant, or ship equipment. A sample display of the products manufactured by the company is available at the sales office. The company has factories at Ontario, California, and in Chicago.

Oils You'll Know

... are what you want, by every test for reliable quality and correct cost that you can make.

Since the days when coaling ships by hand began to go out of style, Associated engineers have been studying oils for marine use.

They are studying them now. Actual exhaustive tests in Associated laboratories result in products which meet the practical requirements of marine men. There is no guess-work in an Associated engineer's recommendation.

Through the years, this attention to marine lubrication and fueling demands has resulted in—

1. Bunker fueling facilities at Pacific Coast ports that fuel a ship without fuss or flurry and absolutely within the time set.
2. A delivery service of lubricating oil in drums and by tank trucks at Pacific Coast ports and at Honolulu and Manila that is complete to the last detail.
3. The development of oils for every type of marine work—specific oils refined to meet definite needs.

Performance records of knots steamed per gallon merit your investigation.

ASSOCIATED OIL COMPANY



4 De Lavals aboard Ms. Courageous—

CLEAN lubricating oil lessens bearing wear . . . clean-fuel oil protects valves, pistons and cylinder liners . . . the combination greatly lowers the cost of operating a Diesel-engine.

Four De Laval Purifiers on the Ms. Courageous make clean-oil protection absolute. Two of these machines continuously remove impurities from the oil in the lubricating and cooling systems of the four McIntosh & Seymour engines. Two others of vapor-tight construction insure that water and abrasives are not injected into the engines with the fuel.

Thus the U. S. Shipping Board has insured its investment in the world's largest Diesel-electric cargo ship.

Bulletin No. 106-y tells how you can similarly safeguard your own investment.

The De Laval Separator Company

165 Broadway, New York 600 Jackson Blvd., Chicago

DE LAVAL PACIFIC COMPANY, 61 Beale St., San Francisco.

THE DE LAVAL COMPANY, Ltd., Peterborough and Winnipeg, Canada.

ALFA-LAVAL CO., LTD., 34 Grosvenor Road, London, S.W. 1.

DE LAVAL
OIL PURIFIERS
Types for Lubricating Oil and Fuel Oil



